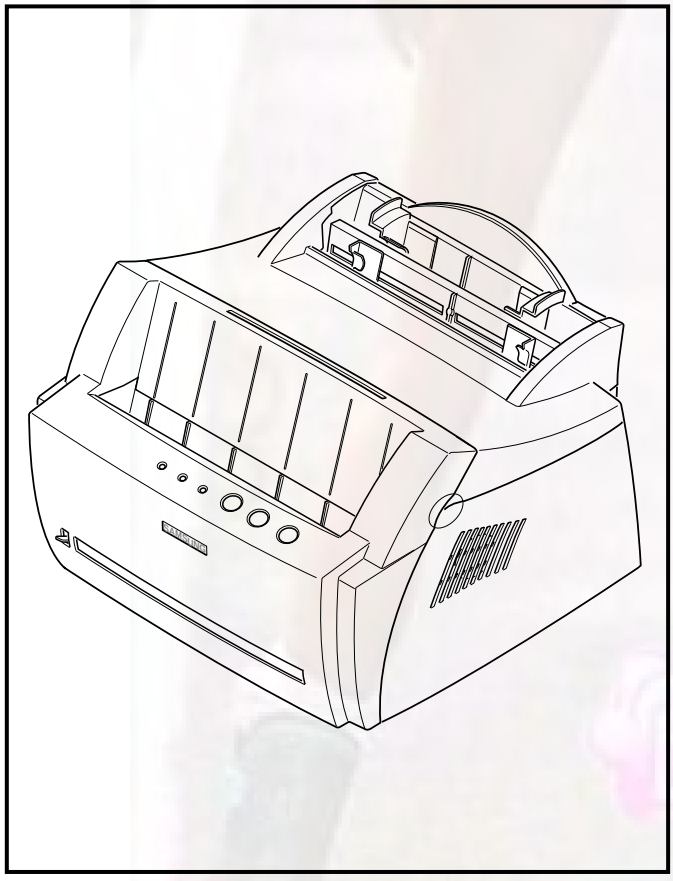
SAMSUNG

LASER PRINTER

ML-4600/XET

SERVICE *Manual*

LASER PRINTER



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1. Precautions

Follow these safety, ESD, and servicing precautions to prevent personal injury and equipment damage.

1-1 Safety Precautions

1. Be sure that all built-in protective devices are in place. Restore any missing protective shields.

2. Make sure there are no cabinet openings through which people- particularly children- might insert fingers or objects and contact dangerous voltages.

3. When re-installing chassis and assemblies, be sure to restore all protective devices, including control knobs and compartment covers.

4. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of this equipment, such as auxiliary connectors, etc. Such alterations and modifications will void the manufacturer's warranty.

5. Components, parts, and wiring that appear to have overheated or are otherwise damaged should be replaced with parts which meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards.

6. Observe the original lead dress, especially near sharp edges, AC, and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board.

7. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they provide could be lost if a replacement component differs from the original. This holds true, even though the replacement may be rated for higher voltage, wattage, etc.

   Components critical for safety are indicated in the parts list with symbols ⚠ ⚠ . Use only replacement components that have the same ratings, especially for flame resistance and dielectric specifications. A replacement part that does not have the same safety characteristics as the original may create shock, fire, or other safety hazards.

1-2 ESD Precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electrostatically Sensitive (ES) Devices”, or ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor “chip” components.
The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, *which should be removed for your personal safety reasons prior to applying power to the unit under test.*

2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.

3. Use only a grounded tip soldering iron to solder or desolder ESDs.

4. Use only an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.

5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.

6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.

7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.

9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

1-3 Super Capacitor or Lithium Battery Precautions

1. Exercise caution when replacing a super capacitor or Lithium battery. There could be a danger of explosion and subsequent operator injury and/or equipment damage if incorrectly installed.

2. Be sure to replace the battery with the same or equivalent type recommended by the manufacturer.

3. Super capacitor or Lithium batteries contain toxic substances and should not be opened, crushed, or burned for disposal.

2. Specification

2-1 Printer

Print Speed	8 PPM (Letter Size, 5% Charcter Pattern)	At Copy Mode
Resolution	1200dpi class	
Source of Light	Laser Diode(LSU)	
Print Method	Non-impact Electrophotography,	Laser Beam
Feed Method	Manual Feeder and Auto Tray	
Feed Reference	Center Reference Loading	
Paper	Size Normal Paper : A4,Letter,Legal,B5, Executive, A5 Envelope : Normal Envelope Length : 149 ~ 365mm Width : 100 ~ 216mm Weight : For MPF, 60 ~ 90g/m^2 For Manual, 60 ~163g/m^2	Bin Type
Paper Capacity	MPF : 150 Sheets (based on 75g/m^2) Manual Slot : 1 Sheet	
Paper Stacker Capacity	Face up : 100 Sheets (75g/m^2,20 lb)	
Warming up Time	Under 30 Sec	
First Printing Time	Stand-By : Under 20Sec	
Power Rating	Power Save Mode :Less than 5min AC 110V ~120V ± 15% 50/60Hz ± 3Hz, AC 220V ~ 240V ± 15% 50/60Hz ± 3Hz	
Power Consumption	Avg. 180Wh	
Power Saving Consumption	Avg. 10Wh Sleep Mode	
Certification & Compliance	FCC, C-UL, CE, CB,TUV	
Acoustic Noise	Stand-by : Less than 35dB Sleep Mode : Less than 29dB Operating : Less than 50dB	

Toner Cartridge	One-Cartridge type
Expected Life Span	50,000 Sheets
Operating Environment	Temperature : 10 ~ 32°C Humidity : 20 ~ 85%
Storage Environment	Temperature : -20 ~ 40°C Humidity : 10 ~ 95%RH
Weight	Net : Max.6.5kg(with Accessory) Gross : Max. 9kg
External Dimension	329(W) X 343(D) x 224(H)mm
Developer	. Life Span : 5% Pattern,Min. 2,500/1,000 Sheets . Developing : Non-magnetic Contact Developing . Charging : Conductive Roller Charging . Density Adjustment : Normal/Economic Mode selectable by the PC driver (Only ML-4500) . Toner Supply Method : Exchanging Toner Cartridge . New Developer Checkable . Transfer System : Conductive Roller Transfer . Fusing System : Temperature & Pressure . OZONE Emission : Max. 0.1 PPM(8 Hours)

2-2 Quality

Conditions		
Paper	Normal Paper	75g/m^2
Environment	Temperature : 20 ~ 25°C Humidity : 40 ~ 60%	
Print Quality		
Image Density	Min. 1.3	
	Min. 1.0(Temperature : 10 ~ 15°C)	
Background	Max. 0.2	
Uniformity	Max. 0.2(Including Continuous Print)	
Fusing	Min. 80% (All Black)	75g/m^2
Start Position	Top : x ± 4.23mm, Side : y ± 4mm	From Left
Skew	Top : Max. ± 1.5mm/117.9mm Side : Max. ±1.8mm/241.3mm	
Orthogonality	± 1.0mm	
Horizontal Scan	± 0.6mm/208mm (Bowed Line Skew : Pattern 1)	
Special Paper Exception	Image Density : Min 1.0 (Envelope) Fusing : Min. 70% (All Black) (Envelope/OHP/Postcard)	
Paper Jam	Less than 1/1,000(75g/m^2 Paper)	
Paper Curl	First : Less than 10mm (10 Sheets, 75g/m^2 Paper) After Cooling : Less than 10mm (10 Sheets, 75g/m^2 Paper)	
Reliability		
Insulation Resistance	Less than 10 MΩ (at DC 500V)	
Dielectric Strength	AC 1000V (DC 1420V), 10mA	
Ground Continuity	Less than 0.1Ω	
Voltage DIP	Rated Voltage ± 15%	
AC Impulse Noise	AC 1000V 10, 100, 200, 400, 1000ns	Rated Power
Leakage Current	Less than 3.5mA	
Surge	6 KV, 500A/3 KV, 500A	
OZONE Emission	Less than 0.1 ppm (8 Hours)	
Top Cover Open	Isolating the input power of the LSU, High Voltage Part, and Fuser	
Overcurrent Protect	Fuse inside the SMPS	
Fusing System		
Trouble Sensing	.The temperature doesn't rise to the specific temperature in the specific time. .The temperature is too high.	Indicate the Fuser error
Overheat Sensing	240 ~ 250°C (The thermostat cuts off the Fuser from the power.)	
Thermistor Open Sensing	.Without the initial temperature change of the Fuser	

2-3 SMPS (Switching Mode Power Supply)

Input (AC)

AC Input Voltage	Europe	USA
Minimum	198V	90V
Typical	230V	120V
Maximum	264V	135V
Max. AC Input Current	2.5Amps	3Amps
Max. Inrush Current	Ap-p (at 20°C)	

Output (DC)

Line Regulation	24V ± 10% 5V ± 5%
Road Regulation	24V ± 10% 5V ± 5%,-5V ± 5%
Ripple Noise	24V : Peak 300mV -5V : Peak 500mV 5V : Peak 500mV
Over Current Protect	24V : 2.7A ± 10% (by Circuit) 5V : A ± 10% (by Circuit)
Over Voltage Protect	24V : 33VDC 5V : 5.6VDC

3. Disassembly and Reassembly

3-1 General Precautions on Disassembly

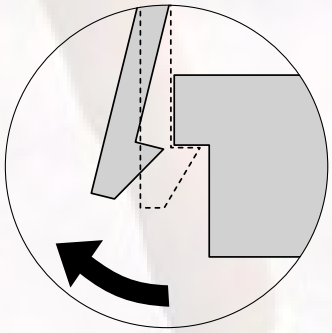
When you disassemble and reassemble components, you must use extreme caution. The close proximity of cables to moving parts makes proper routing a must. If components are removed, any cables disturbed by the procedure must be restored as close as possible to their original positions. Before removing any component from the machine, note the cable routing that will be affected.

Whenever servicing the machine, you must perform as follows:

1. Remove the print cartridge. Do not expose the cartridge to direct room light or sun light, and be careful not to scratch the drum surface.
2. Turn the power switch off.
3. Unplug all the cables from the printer.
4. Replace with only an authorized component.
5. Do not force to open or fasten a plastic material component.
6. Be careful no obstacles are included when you reassemble components.
7. When you reassemble components, be careful small size components are located in place.
8. If you turn the machine over to replace some parts, toner or paper particles may contaminate the LSU window. Protect the LSU window with clean paper.

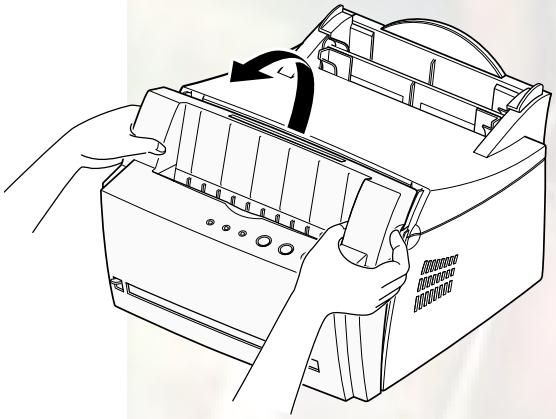
Releasing Plastic Latches

Many of the parts are held in place with plastic latches. The latches break easily; release them carefully. To remove such parts, press the hook end of the latch away from the part to which it is latched.

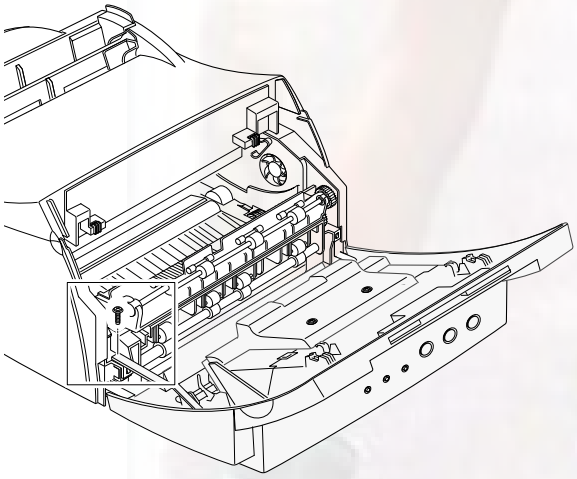


3-2 OPE Cover

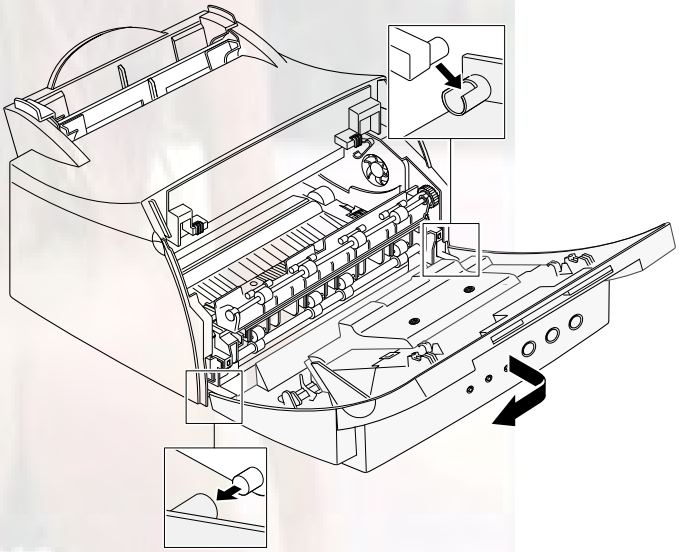
1. Hold both sides of the cover and pull it towards you.



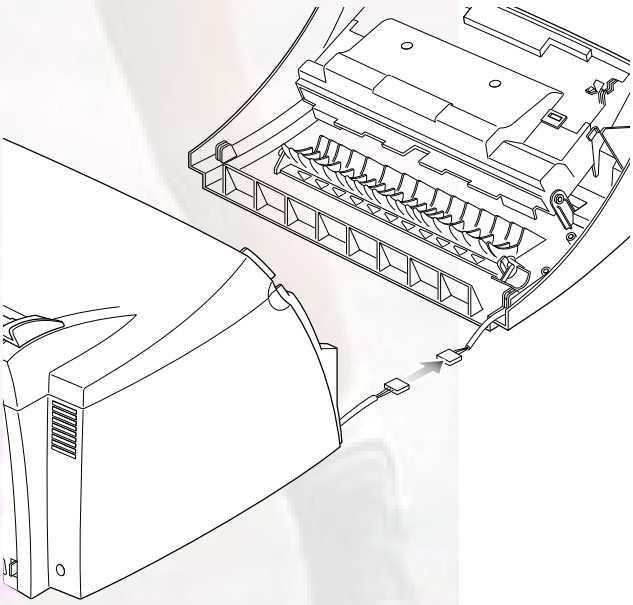
2. Remove the one screw to release the stopper securing the cover to the main body.



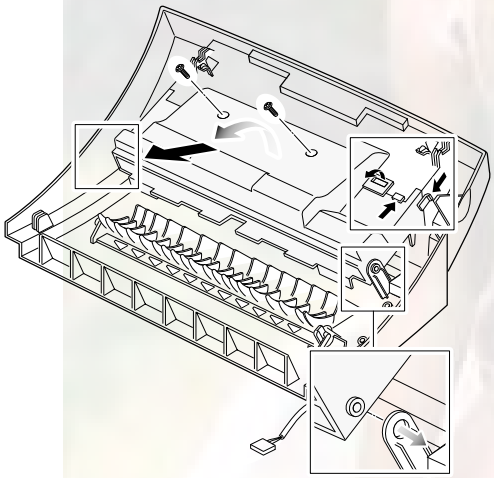
3. Release the right-bottom of the cover, then pull it in the direction of arrow to release the other end.



4. Unplug the connector connecting the OPE cover to the main body and remove the cover.



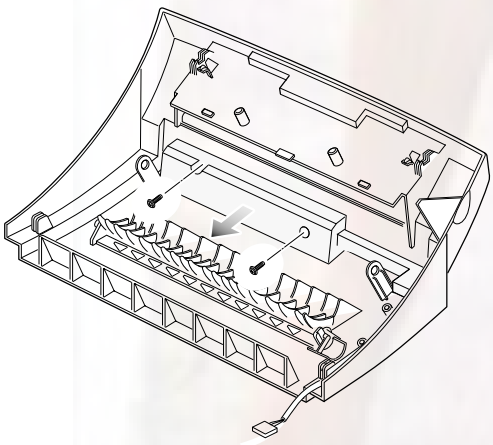
5. Remove the two screws and pull the guide stacker in the direction of arrow. Then Spread out the parts securing the guide stacker on both sides to release the cover.



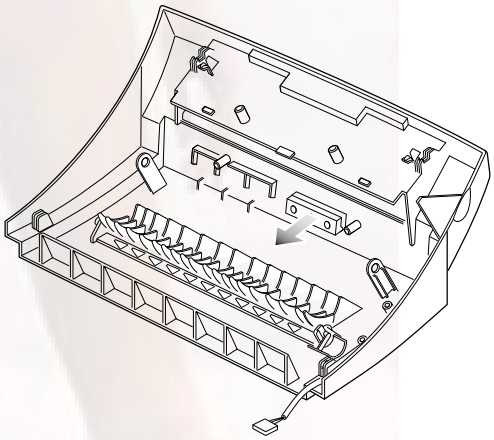
3-3 OPE Board

1. Before you remove the board, you should remove the OPE cover (see page 3-2).

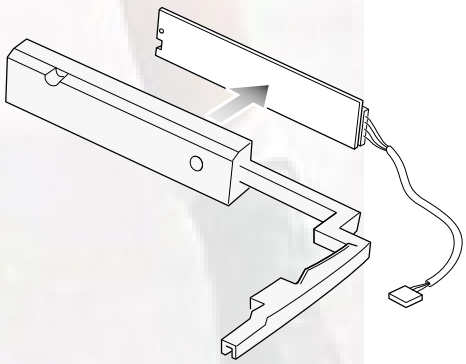
2. Remove the three screws, then remove the cover PCB.



3. Remove the LED.



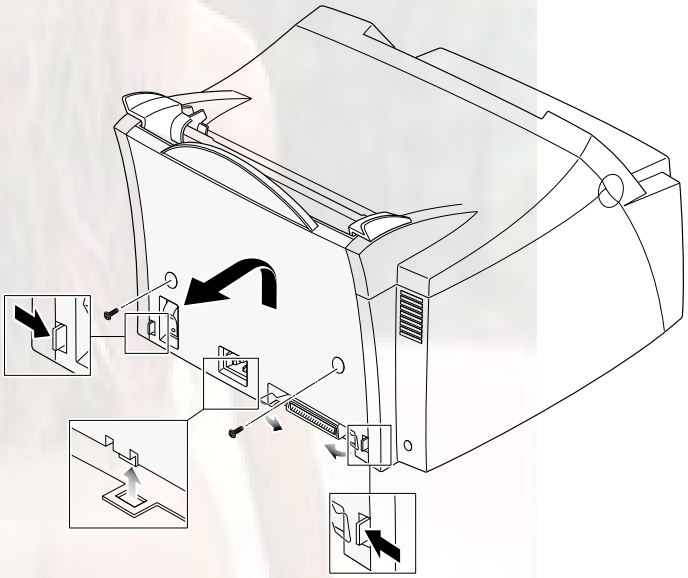
4. Remove the PCB from the cover PCB.



3-4 Rear Cover

1. Remove the two screws on the back of the machine.

2. Pull the handles on both sides in the direction of the arrows then lift the rear cover to unlatch it from the bottom, then remove the cover.

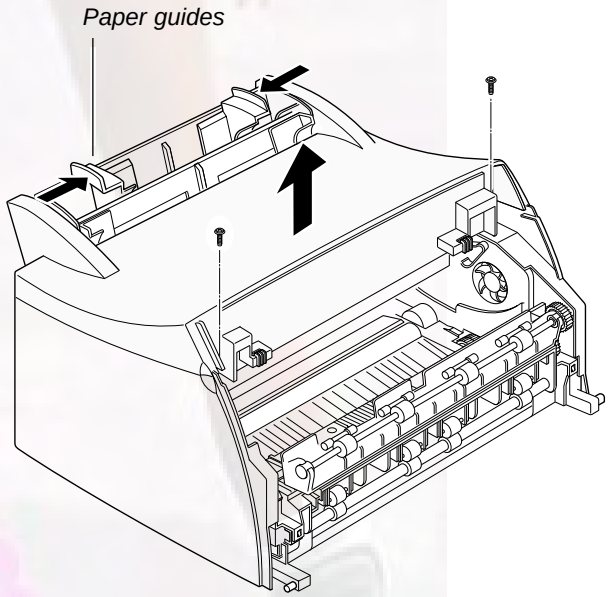


3-5 Top Cover

1. Before you remove the top cover, you should remove:

   – OPE cover (see page 3-2)
   – Rear cover (see above)

2. Slide the paper guide on the paper tray inwards. Remove the two screws on the top cover, then remove the cover.

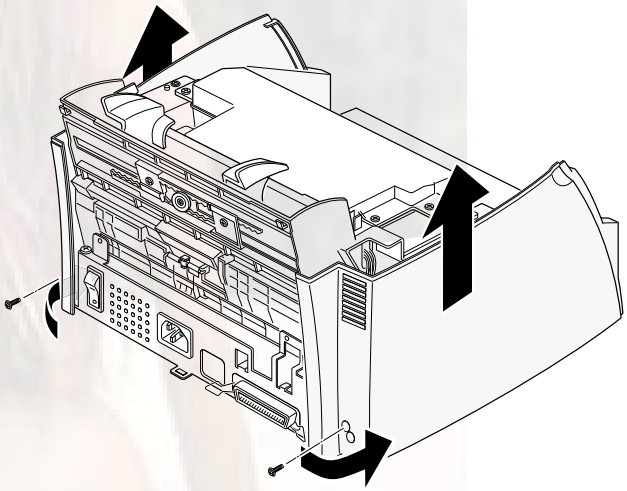


3-6 Side covers (R, L)

1. Before you remove the top cover, you should remove:

   – OPE cover (see page 3-2)
   – Rear cover (see page 3-4)
   – Top cover (see page 3-4).

2. Remove the two screws and pull the left and right side covers in the direction of arrow.

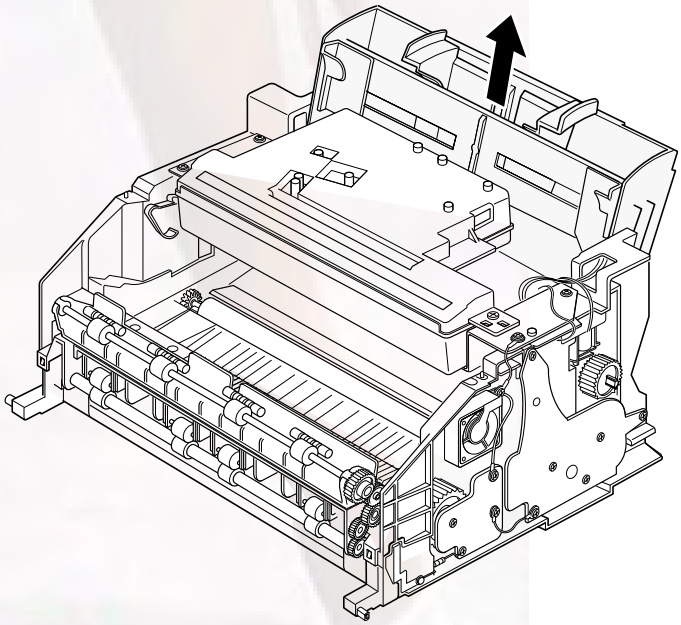


3-7 Paper Tray

1. Before you remove the paper tray, you should remove:

   – OPE cover (see page 3-2)
   – Rear cover (see page 3-4)
   – Top cover (see page 3-4)
   – Side covers (see above)

2. Take out the tray from the main frame.

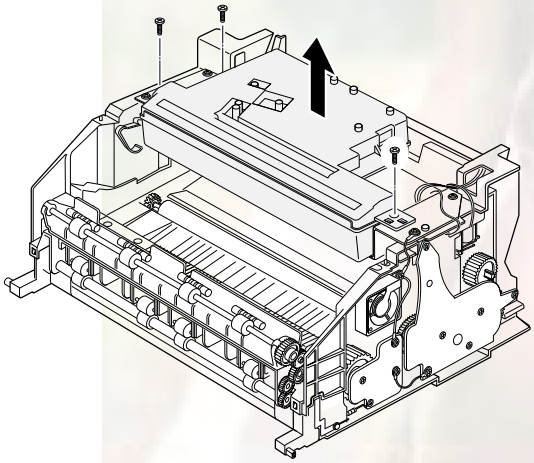


3-8 LSU

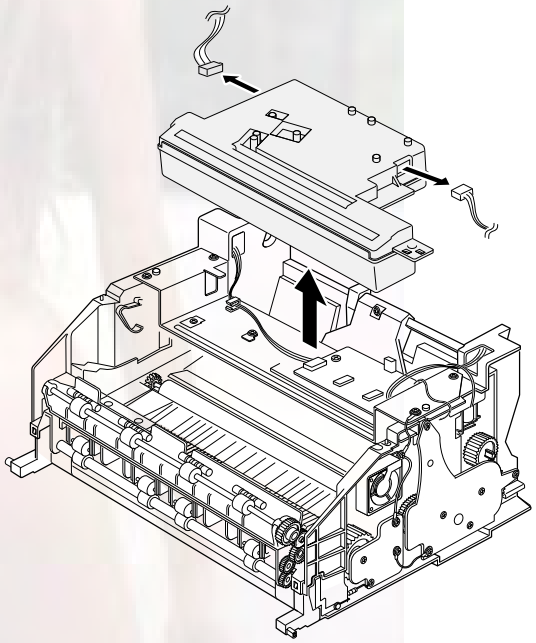
1. Before you remove the LSU, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)

2. Remove the three screws securing the LSU.



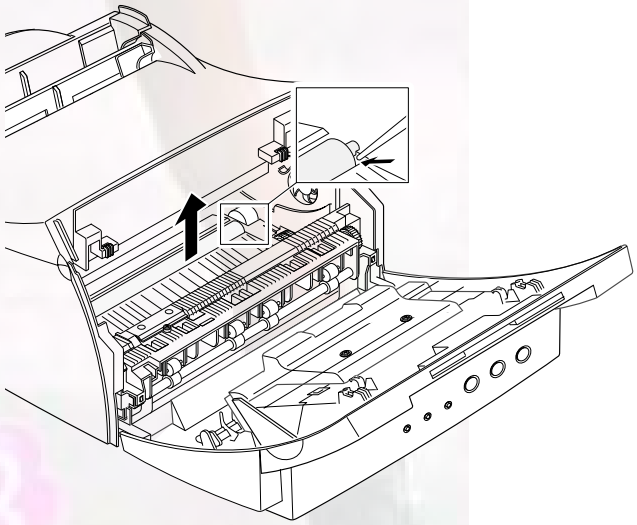
3. Unplug two connectors from the LSU and remove the LSU.



3-9 Transfer Roller

1. Open the front cover.

2. Lift the transfer roller using a proper tool as shown in the figure and take out the roller.

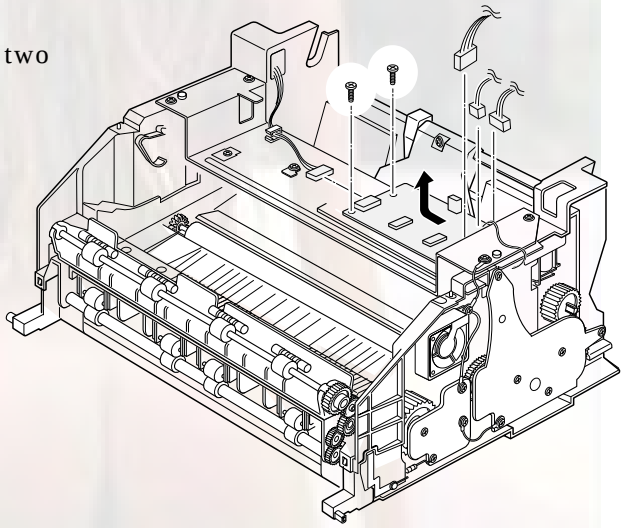


3-10 Engine Board

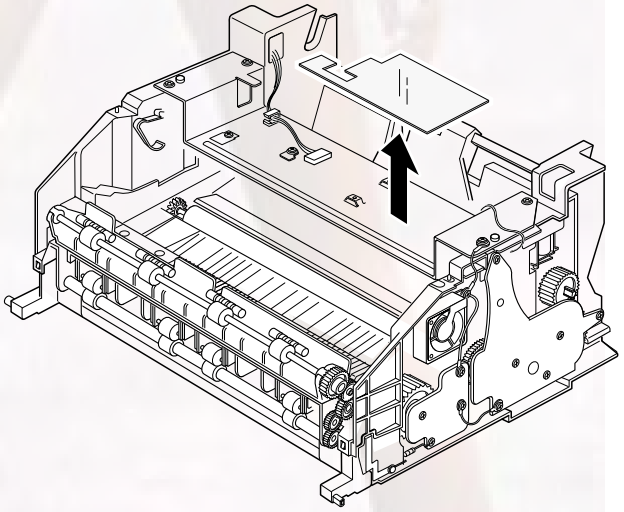
1. Before you remove the engine board, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – LSU (see page 3-6)

2. Unplug the four connectors and remove the two screws from the engine board, then pull the board in the direction of arrow.



3. Remove the Insulator which was under the engine board.

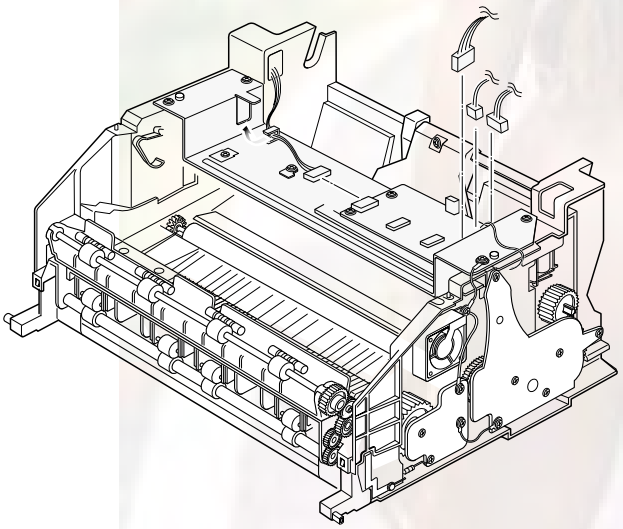


3-11 Pick-up Roller ass'y

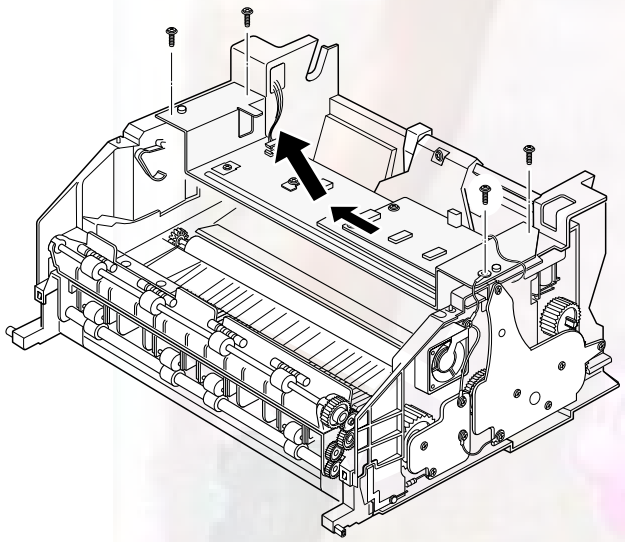
1. Before you remove the pick-up roller ass'y, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – LSU (see page 3-6)

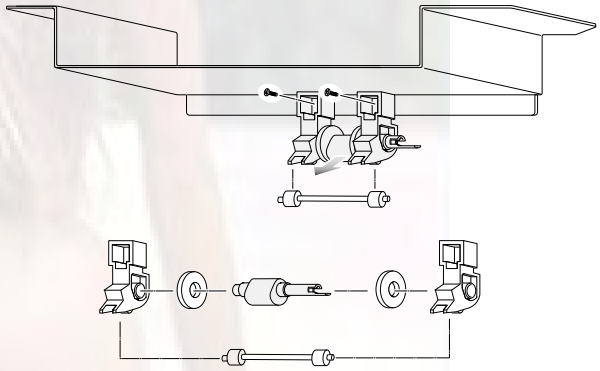
2. Unplug all the connectors from the engine board.



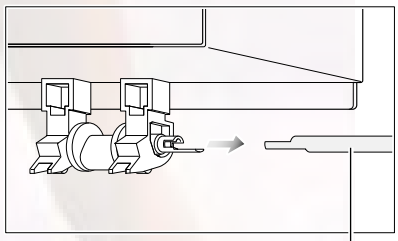
3. Remove the four screws securing the plate and remove the plate as shown below.



4. Remove the two screws and remove the roller from the plate.



Note: When you reassemble the pick-up roller, make sure that the right end of the pick-up roller fits into the pick-up gear shaft.



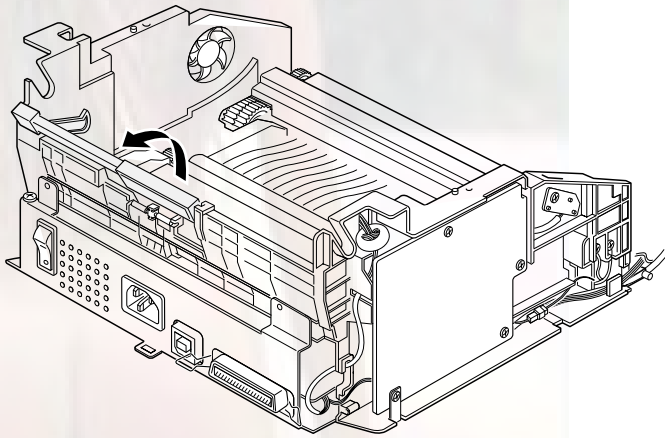
Pick-up gear shaft

3-12 Knock-up ass'y

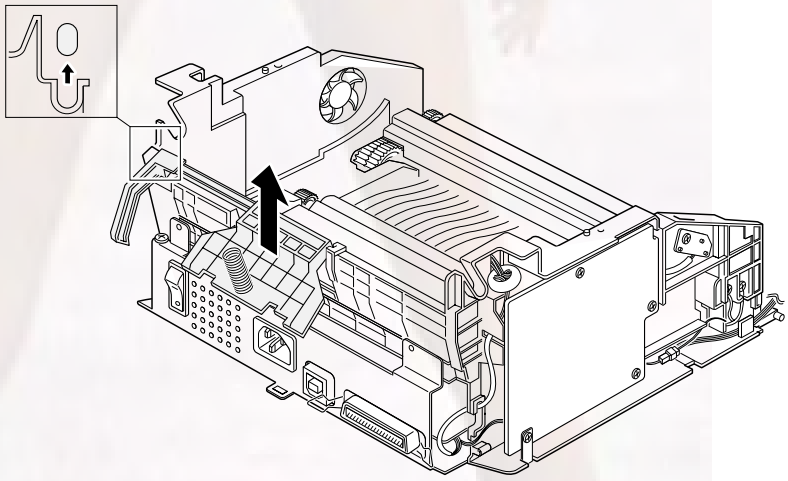
1. Before you remove the knock-up ass'y, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – LSU (see page 3-6)
   – Plate in the pick-up roller ass'y (see page 3-8)

2. Pull the knock-up ass'y fully backward.



3. Remove the knock-up ass'y from the main frame. Make sure it is properly unlatched.

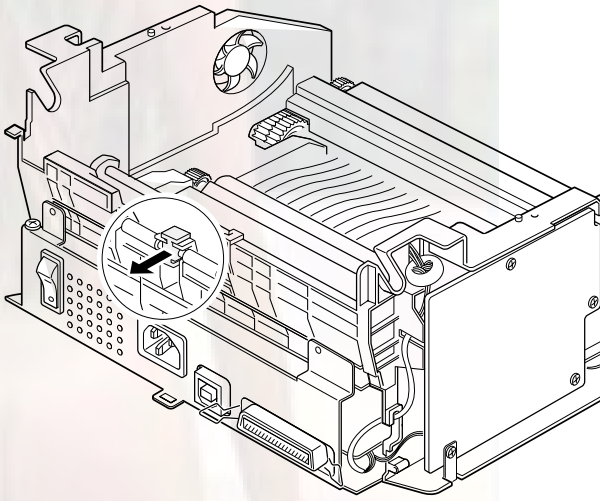


3-13 Cap-pad

1. Before you remove the cap-pad, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – LSU (see page 3-6)
   – Plate in the pick-up roller ass'y (see page 3-8)
   – Knock-up ass'y (see page 3-10)

2. Take out the cap-pad from the main frame.

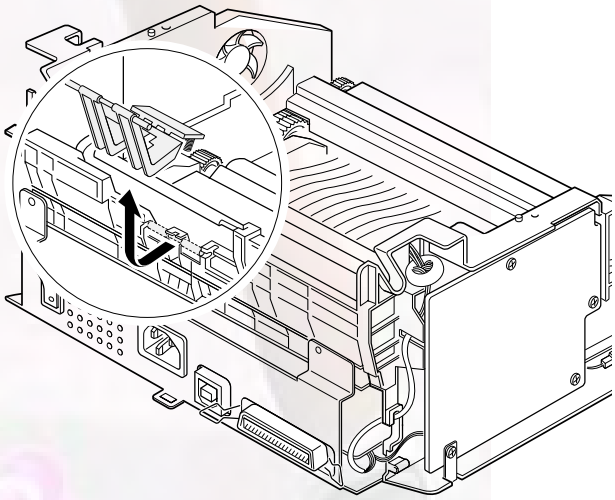


3-14 Holder-pad

1. Before you remove the holder-pad, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – LSU (see page 3-6)
   – Plate in the pick-up roller ass'y (see page 3-8)
   – Knock-up ass'y (see page 3-10)

2. Remove the holder-pad from the main frame.

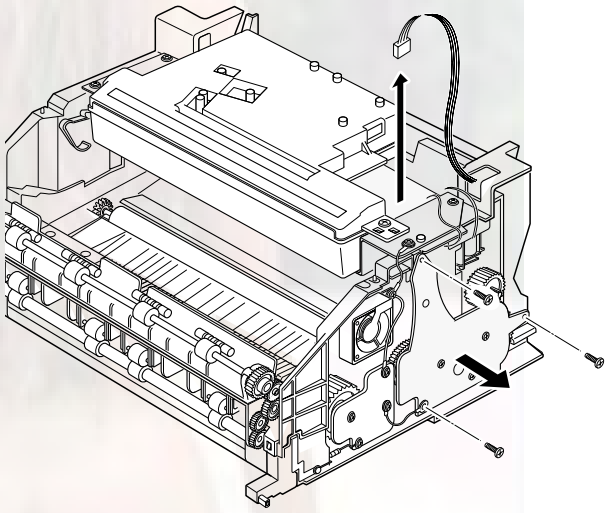


3-15 Motor ass'y

1. Before you remove the motor ass'y, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)

2. Remove the three screws securing the motor ass'y and unplug one connector from the engine board, then remove the motor ass'y.

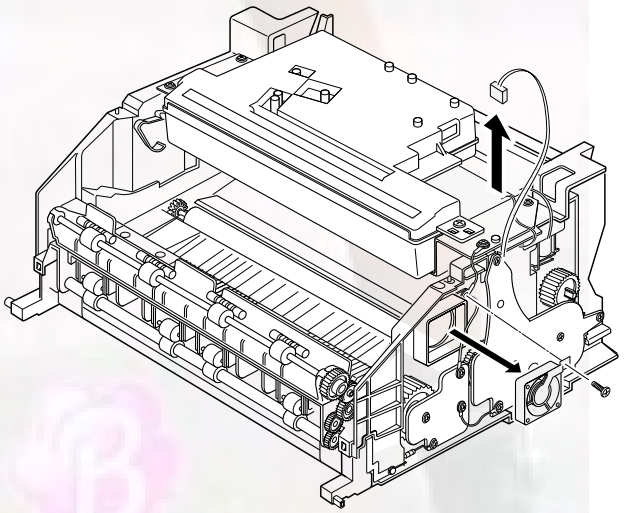


3-16 Fan

1. Before you remove the fan, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)

2. Unplug the one connector on the fan from the engine board, remove the one screw, then remove the fan.

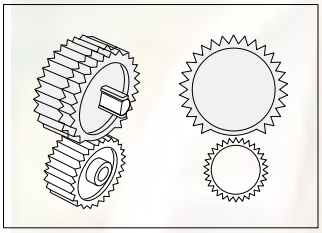


3-17 Gear Pick-up ass'y

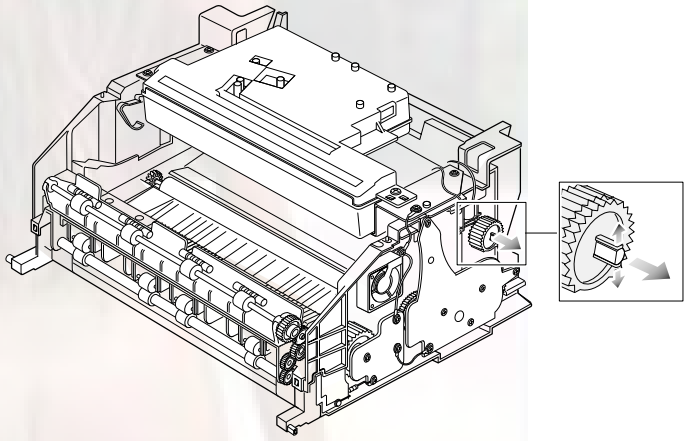
1. Before you remove the gear pick-up ass'y, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)

Note: When you reassemble the gear, make sure that the direction of the gear is correct.



2. Spread out the two snap-fits on the gear to release the gear, then remove the gear pick-up ass'y from the main frame.

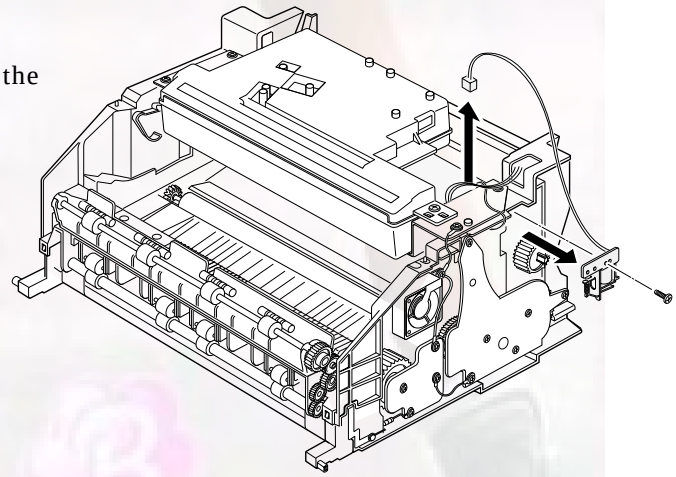


3-18 Solenoid

1. Before you remove the solenoid, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)

2. Unplug the connector on the solenoid from the engine board, remove the one screw, then remove the solenoid.

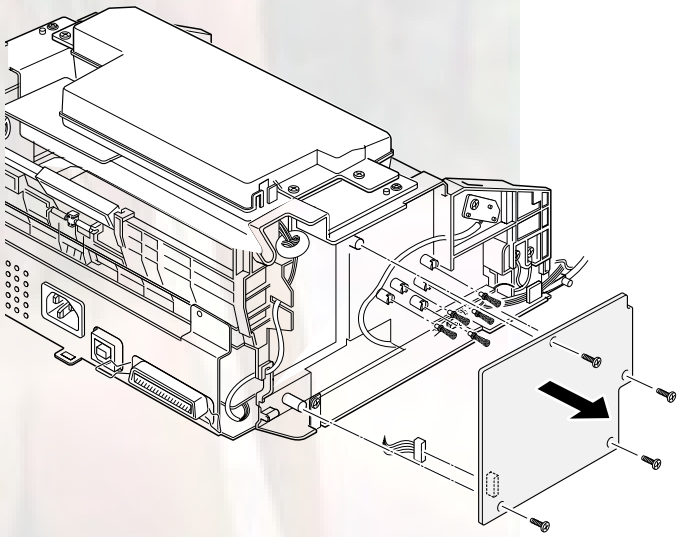


3-19 HVPS Board

1. Before you remove the HVPS board, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)

2. Remove three three screws and the connector from the HVPS board, then remove the board.



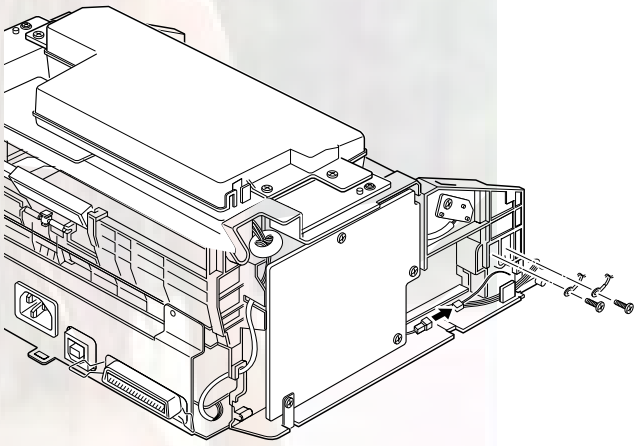
Note: when you reassemble the board, make sure that the five terminals are correctly inserted in place.

3-20 Fuser ass'y

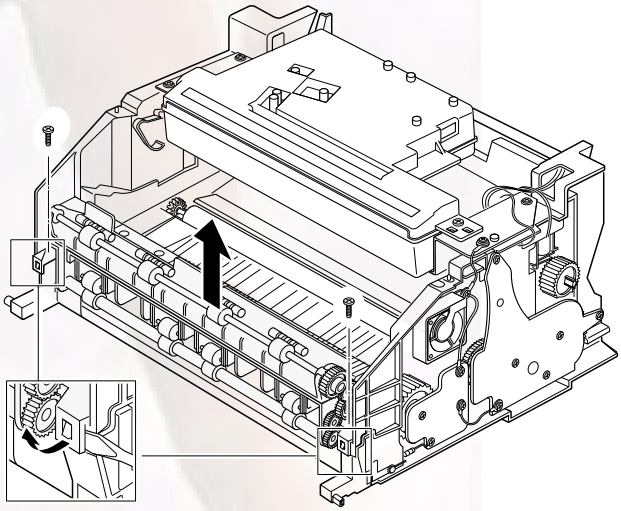
1. Before you remove the fuser ass'y, you should remove:

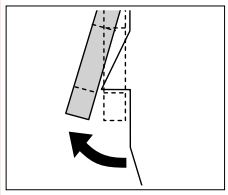
   – All covers (see page 3-2, 3-4, 3-5)

2. Remove the two ground screws and unplug the one connector as shown in the figure.



3. Remove the two screw and unlatch the fuser ass'y using a proper tool as shown in the figure, then remove the fuser ass'y.



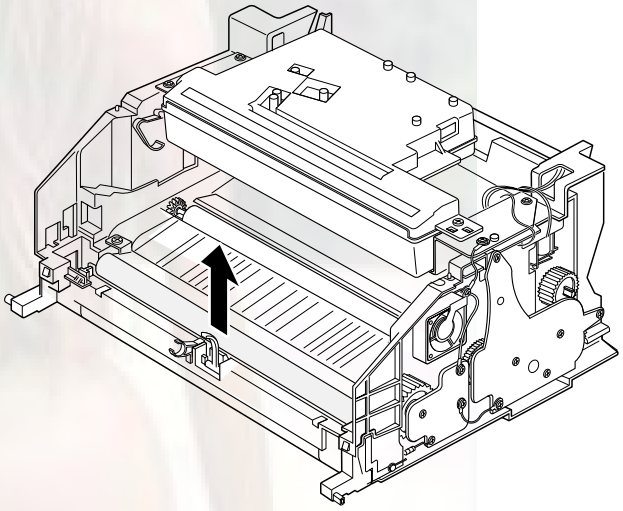


3-21 Pressure Roller

1. Before you remove the pressure roller, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – Fuser ass'y (see page 3-14)

2. Lift and remove the pressure roller from the main frame.

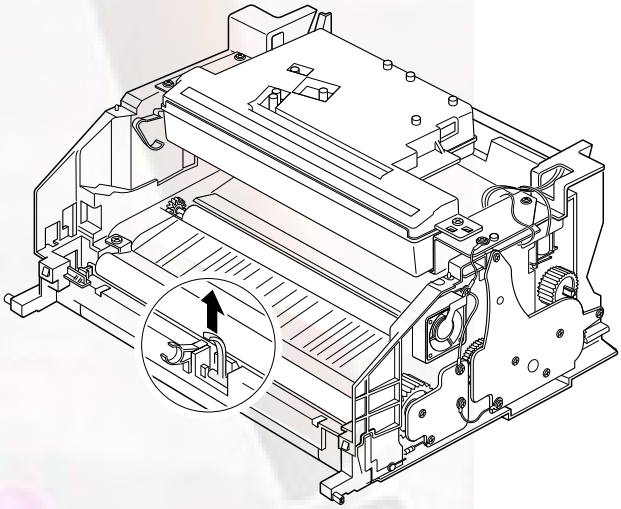


3-22 Actuator-exit

1. Before you remove the actuator-exit, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – Fuser ass'y (see page 3-15)

2. Lift and remove the actuator-exit from the main frame.

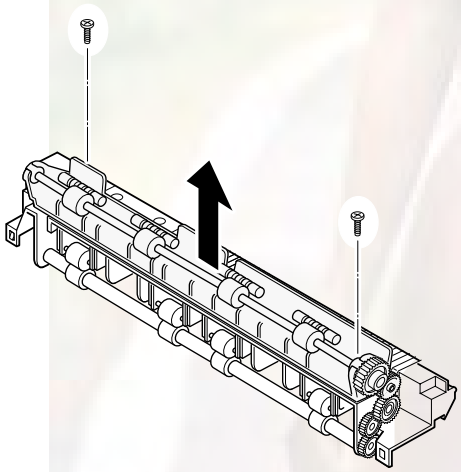


3-23 Thermostat

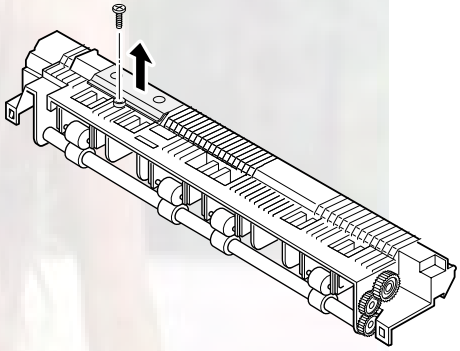
1. Before you remove the thermostat, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – Fuser ass'y (see page 3-14)

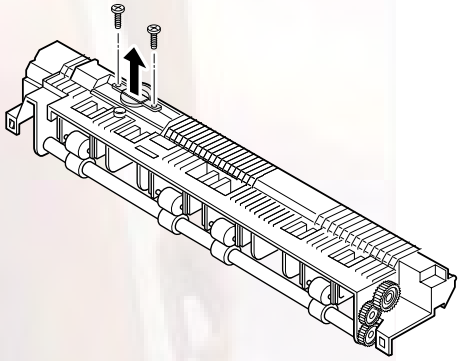
2. Remove the two screw securing the face up and remove the face up.



3. On the fuser ass'y, remove the one screw, then remove the thermostat cover.



4. Remove the two screws and take out thermostat from the fuser ass'y.

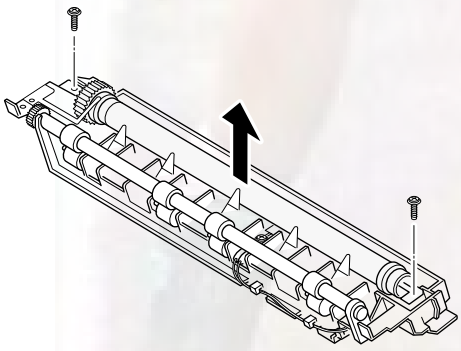


3-24 Halogen Lamp

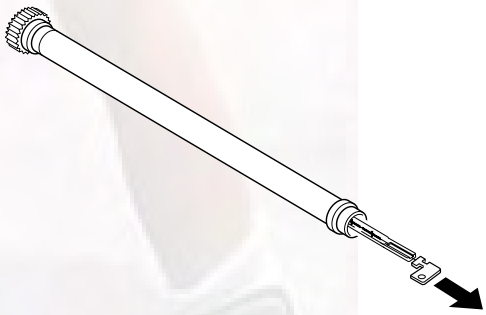
1. Before you remove the thermostat, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – Fuser ass'y (see page 3-14)

2. On the fuser ass'y, remove the two screws, then remove the heat roller.



3. Remove the halogen lamp from the heat roller.



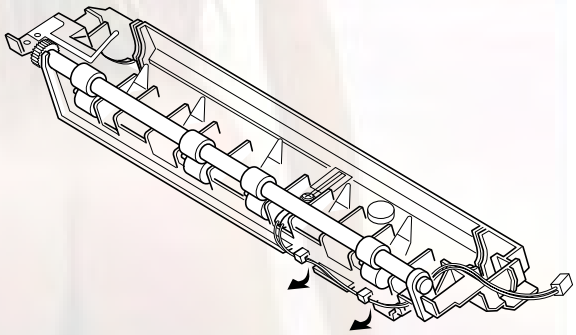
3-25 Thermistor

1. Before you remove the thermister, you should remove:

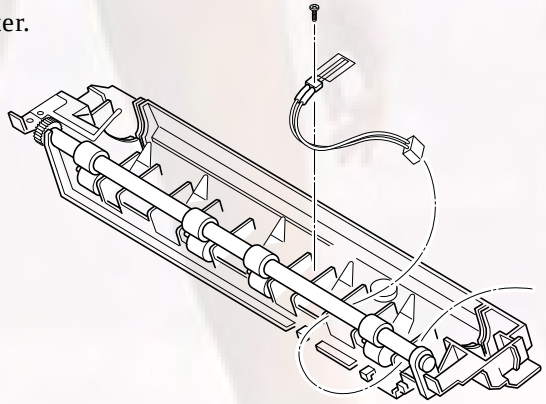
   – All covers (see page 3-2, 3-4, 3-5)
   – Fuser ass'y (see page 3-14)

2. On the fuser ass'y, remove the heat roller as described on page 3-16.

3. Unwrap the thermister wire as shown in the figure.



4. Remove the one screw, then remove the thermister.

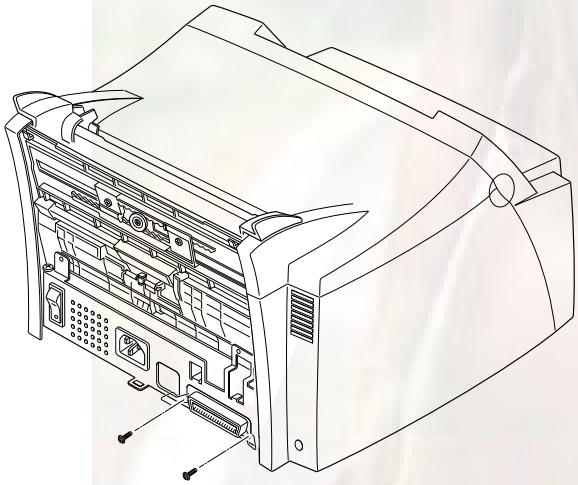


3-26 Shield Engine ass'y

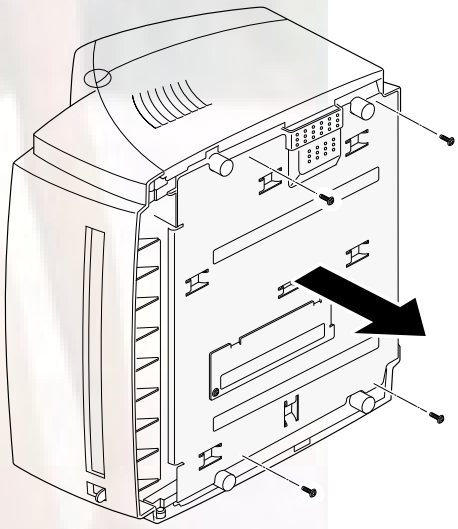
1. Before you remove the shield engine ass'y, you should remove:

   – Rear cover (see page 3-4)

2. Remove the two screws.



3. Remove the four screws securing the shield engine ass'y and remove the shield engine ass'y from the main frame.

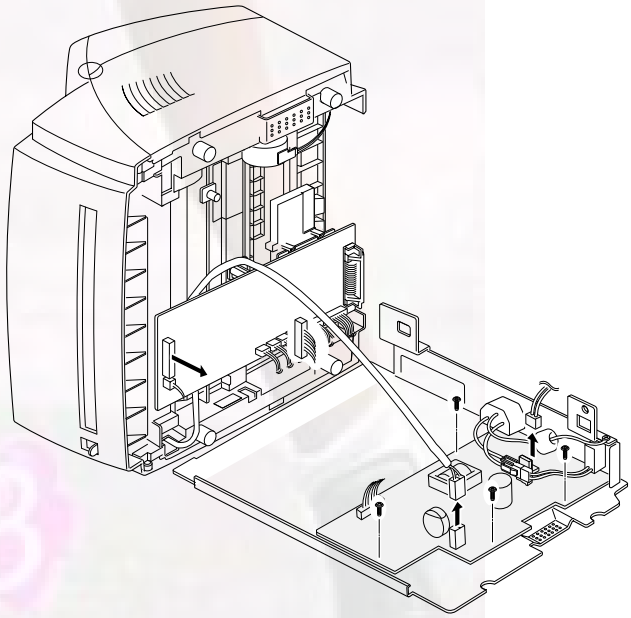


3-27 SMPS Board

1. Before you remove the SMPS board, you should remove:

   – Rear cover (see page 3-4)
   – Shield engine ass'y (see above)

2. Remove the four screws and on the SMPS board, unplug the two connectors from the SMPS board and the one connector from the main board, then remove the SMPS board.

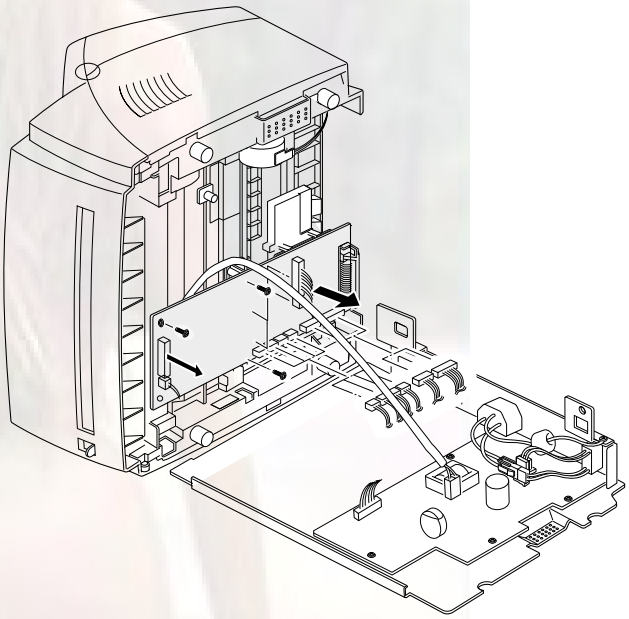


3-28 Main Board

1. Before you remove the main board, you should remove:

   – Rear cover (see page 3-4)
   – Shield engine ass'y (see page 3-18)

2. Remove the two screws unplug and all the connectors from the main board, then remove the board.

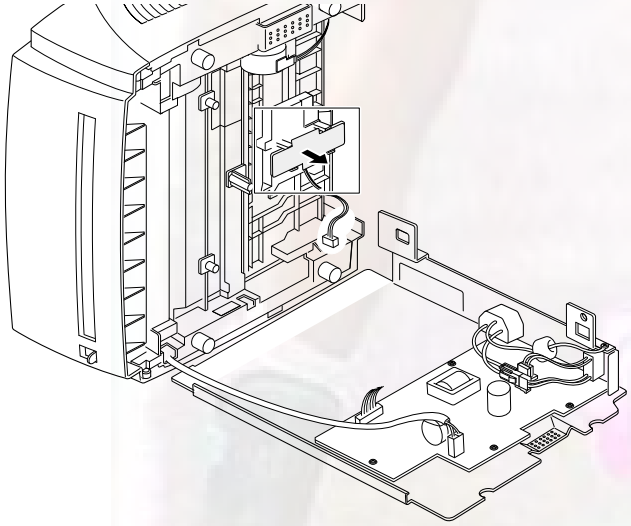


3-29 Sensor Board

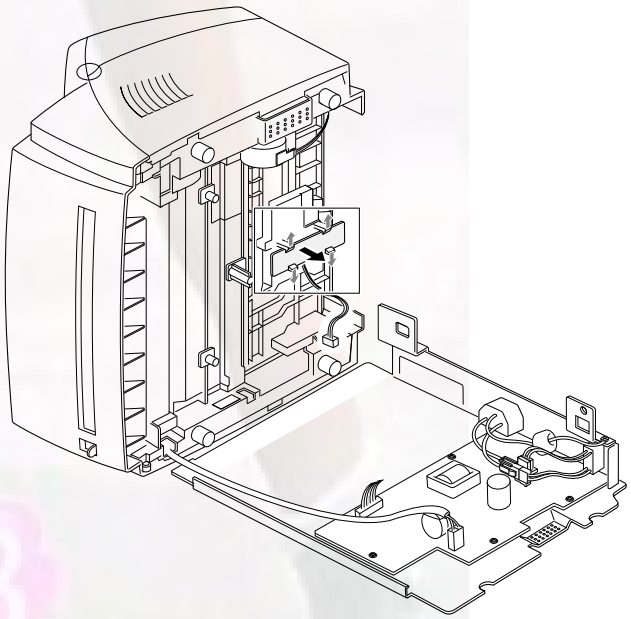
1. Before you remove the sensor board, you should remove:

   – Rear cover (see page 3-4)
   – Shield engine ass'y (see page 3-18)

2. Release four snap-fits securing the insulator engine board and remove the insulator engine board.



3. Release four snap-fits securing the sensor board, then remove the sensor board.

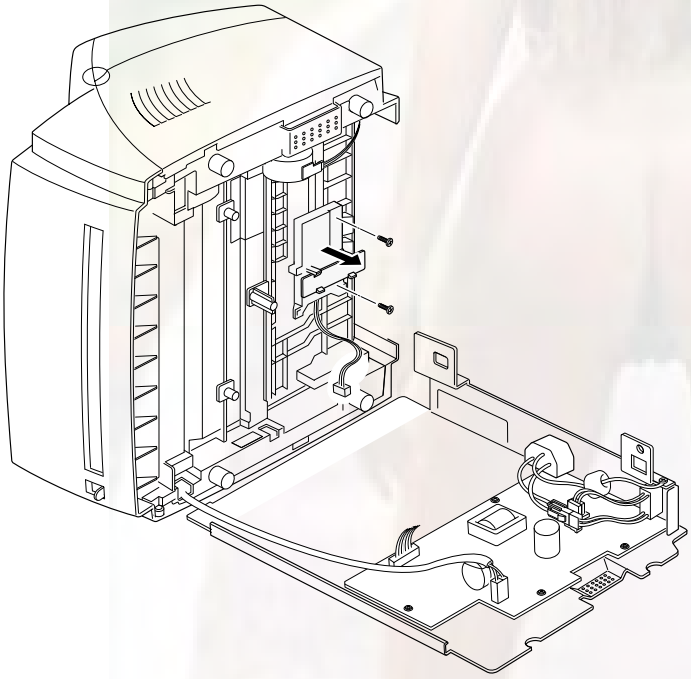


3-30 Feed Sensor and Empty Sensor

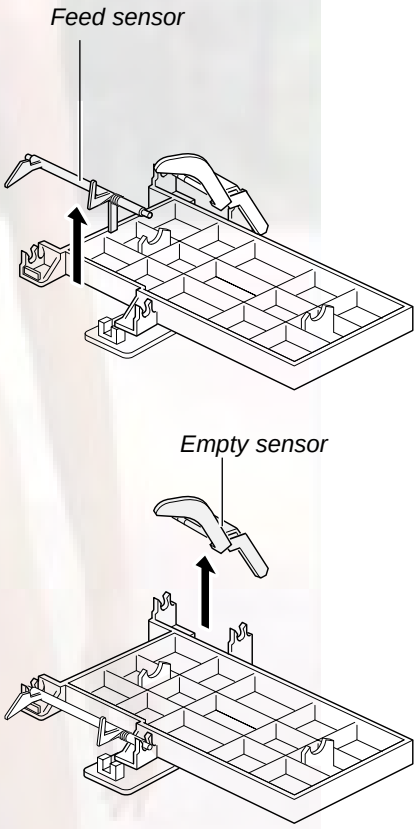
1. Before you remove these parts, you should remove:

   – Rear cover (see page 3-4)
   – Shield engine ass'y (see page 3-18)

2. Unplug the one connector from the main board and remove the two screws securing the holder feed ass'y, then remove the holder feeder ass'y.



3. Remove the feed sensor and the empty sensor.

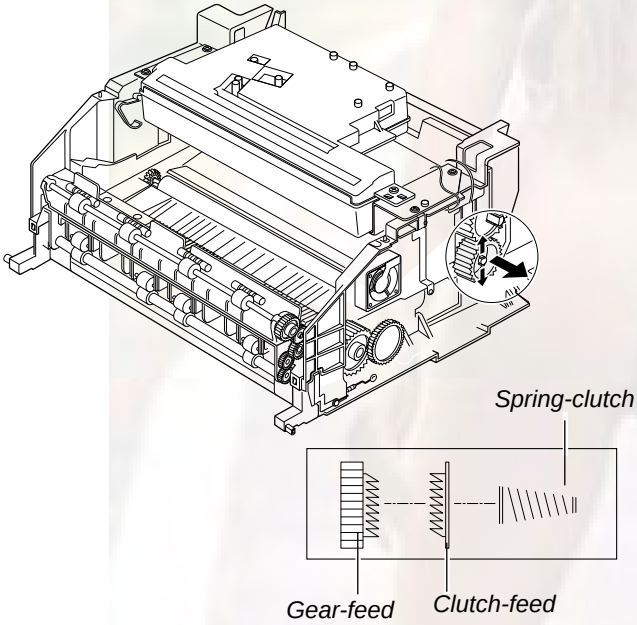


3-31 Feed Roller

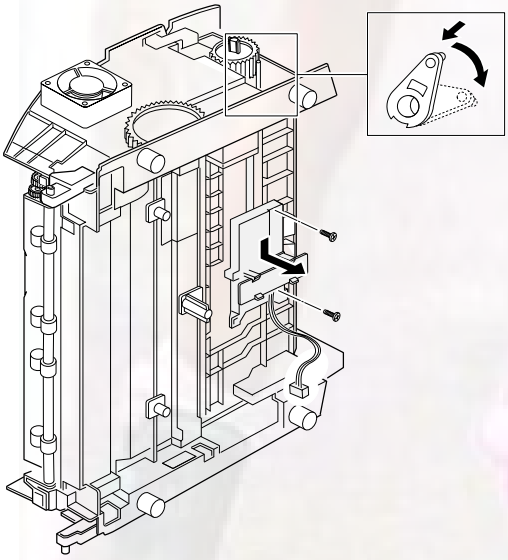
1. Before you remove the roller, you should remove:

   – All covers (see page 3-2, 3-4, 3-5)
   – Motor ass'y (see page 3-11)

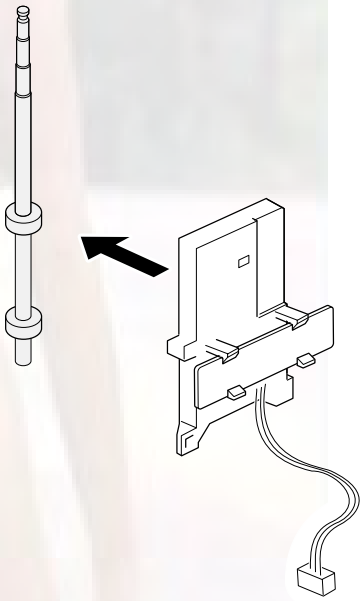
2. Spread out the two snap-fits on the gear to release the gear, then remove gear-feed, spring-clutch and clutch-feed from the gear.



3. Rotate the pick-up bushing in the direction of arrow, then remove the the feed roller ass'y.



4. Remove the feed roller from the holder.



MEMO

4. Maintenance & Troubleshooting

4-1 Preventative Maintenance

The cycle period outlined below is a general guideline for maintenance. The example list is for an average usage of 50 transmitted and received documents per day. Environmental conditions and actual use will vary these factors. The cycle period given below is for reference only.

COMPONENT	REPLACEMENT CYCLE
Cartridge	2,500 Pages
Pickup Roller	60,000 Pages
Feed Roller	60,000 Pages
Transfer Roller	60,000 Pages
Fuser	60,000 Pages
Driver	60,000 Pages

4-2 Print Quality

No	Roller	Abnormal image period	Kind of abnormal image
1	OPC Drum	75.4mm	•White spot on black image •Black spot
2	Charge Roller	37.7mm	Black spot
3	Supply Roller	26.8mm	Horizontal density band
4	Develope Roller	31.6mm	Horizontal density band
5	Transfer Roller	47.1mm	Black side contamination/transfer fault
6	Heat Roller	57.1mm	Black spot, White spot
7	Pressure Roller	56.5mm	Black side contamination

4-3 DCU Control

4-3-1 DCU Setup

DCU is used to diagnose the printer malfunctions. To use DCU, open and remove the Printer's exit cover in front, and remove the bottom cover from left. Connect the DCU harness wire (10 pin-to-4 pin) to CN9 (4 pins) on the control board.

4-3-2 Status Code

Connect the DCU to the printer and turn power on. The DCU display Status Code in the 7 segment LEDs. There are two kinds of Status Codes; Normal and Error. And their codes mean the printer operating status.

NORMAL STATUS CODE

These codes mean paper location on the paper path when the printer is printing, or warming up.

61	Warm up	The printer warms up when the printer is turned on or the cover is closed, or wake from sleep mode.
00~05	Ready(paper type)	The printer is in printable state. The paper type is sensed after one page printing.(Only 00 display because the paper type is setted Legal after one page printing.) 00: Legal , 01: Letter , 02: A4 , 03: EXEC , 04: B5 , 05: Folio
20	Print Start	The code is displayed when engine controller is received 'PRINT' command from the video controller.
30	Feed Sensor On	It means that paper is passing the feed sensor.
50	Paper out	It means that paper passed the exit sensor.
69	Sleep Mode	It means that the printer fuser is turned off, and the power consumption is minimized.

ERROR STATUS CODE

If the printer stops printing by any malfunction, the DCU displays its error status code.

60,62,68	Fuser Error	These codes mean the fuser error status. Heat lamp, thermistor, thermostat open or thermistor short. The 'Low Temperature Error' is checked when the printer is printing. 60: Open Fuser Error 62: Low Heat Error 68: Over Heat Error
64	Cover Open	The printer cover open or no toner cartridge in the machine.
70	No Paper	The paper is not loaded in the printer paper tray.
71	Paper Jam 0	Displays when the paper leading edge stops between the pick-up unit and the feed sensor.
72	Paper Jam 1	Displays when the paper leading edge stops between the feed sensor and the exit sensor.
73	Paper Jam 2	Displays when the paper leading edge stops after the exit sensor.
95	LSU Not Ready	The LSU scanner motor is not ready or 'Hsync' signal is not output.

4-3-3 Diagnostic Mode

When the printer malfunction occurs and DCU displays Error Status Code, you can use the Diagnostic Mode to find a problem and fix it.

DIAGNOSTIC CODE

When you fix the malfunction, you can make only a unit of machine operated in Diagnostic mode. To enter Diagnostic mode, push three buttons ([DOWN], [SHIFT], [STOP]) simultaneously and turn the printer power on. When the DCU displays '78', release the keys in 2-3 seconds, then the DCU displays '00'. By using [UP] or [SHIFT] and [DOWN] keys, select the desired Diagnostic Code, and push the [ENTER] key to perform the operation. To stop its operation, push the [SHIFT] and [ENTER] buttons.

00	MAIN MOTOR OPERATING SYSTEM Only main motor turns continuously.
01	MAIN HIGH VOLTAGE ON (THV) There is output of -1550V to MHV terminal.
02	TRANSFER HIGH VOLTAGE (-) ON (THV -) There is output of -1300V to THV terminal.
03	TRANSFER HIGH VOLTAGE (+) REFERENCE ON (THV +) There is output of +1300V to THV terminal.
04	DEV/SUPPLY HIGH VOLTAGE There is output DEV and SUPPLY high voltage to each HV terminals. At this time, the left one of three LEDs (Diagnostic Mode Indicator) in the DCU lights, and DEV HV is -630V. To change this voltage, push the [UP] button, and two (center and right) of three LEDs light, there are output -530V to DEV HV terminal.
05	LSU OPERATING SYSTEM The scanning motor in LSU turns and the right one of three LEDs lights. To check the LD (Laser Diode) in the LSU at this state, push the [UP] button, the LD is driven, and the center LED lights. If the LD is normal, all three LEDs light.
06	PICKUP CLUTCH ON The solenoid in machine operate. To release the solenoid, push the [SHIFT] and [ENTER] buttons.
07	PEMPTY SENSOR TEST When you make the actuator of PEMPTY/PWIDTH sensor operate, the left ome of threeLEDs lights.
08	FEED & EXIT SENSOR TEST The feed & exit sensor also can be tested by the same method of the code '07'.

09	COVER OPEN SENSOR TEST Same method of the code ‘07’.
10	Same method of the code ‘06’.
11	HOT BURN TEST When you push the [ENTER] button in this code, the machine prints endlessly without any sensing operation. To stop this operation, turn the printer power off.
12	CLEANING MODE PRINT MODE Print pages to cleanng the OPC drum in CRU. Same method of the code ‘06’
13	THV (+) TRIGGER, ALL HV There is all output of high voltages to each HV terminal, and the Motor operate.
14	PTL TEST This operation mean PTL LED status.
15	FAN TEST This operation mean FAN status.

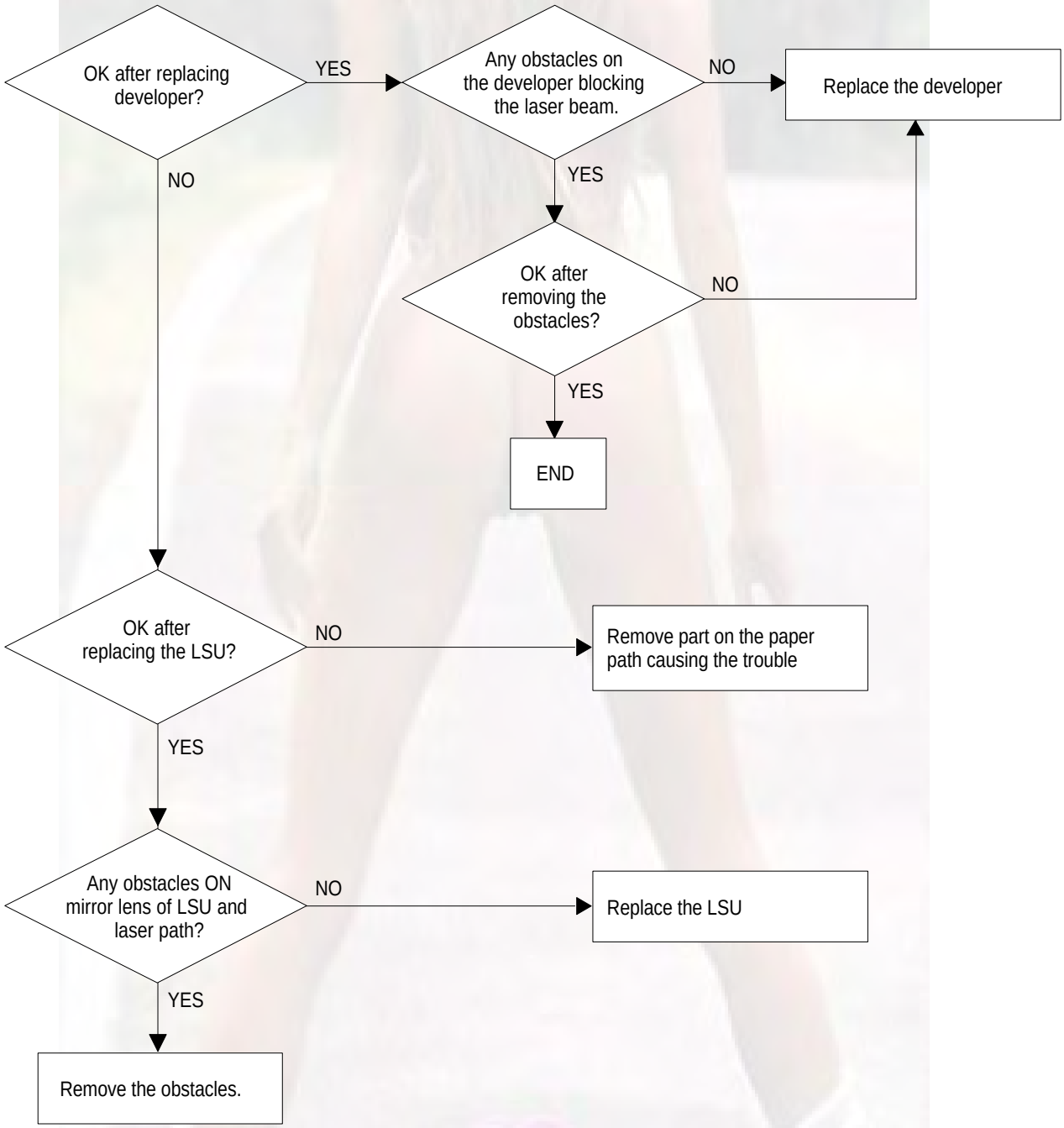
4-3-4 Self Test Button

When you push this button, the machine prints ‘vertical line’ pattern while it is pushed.

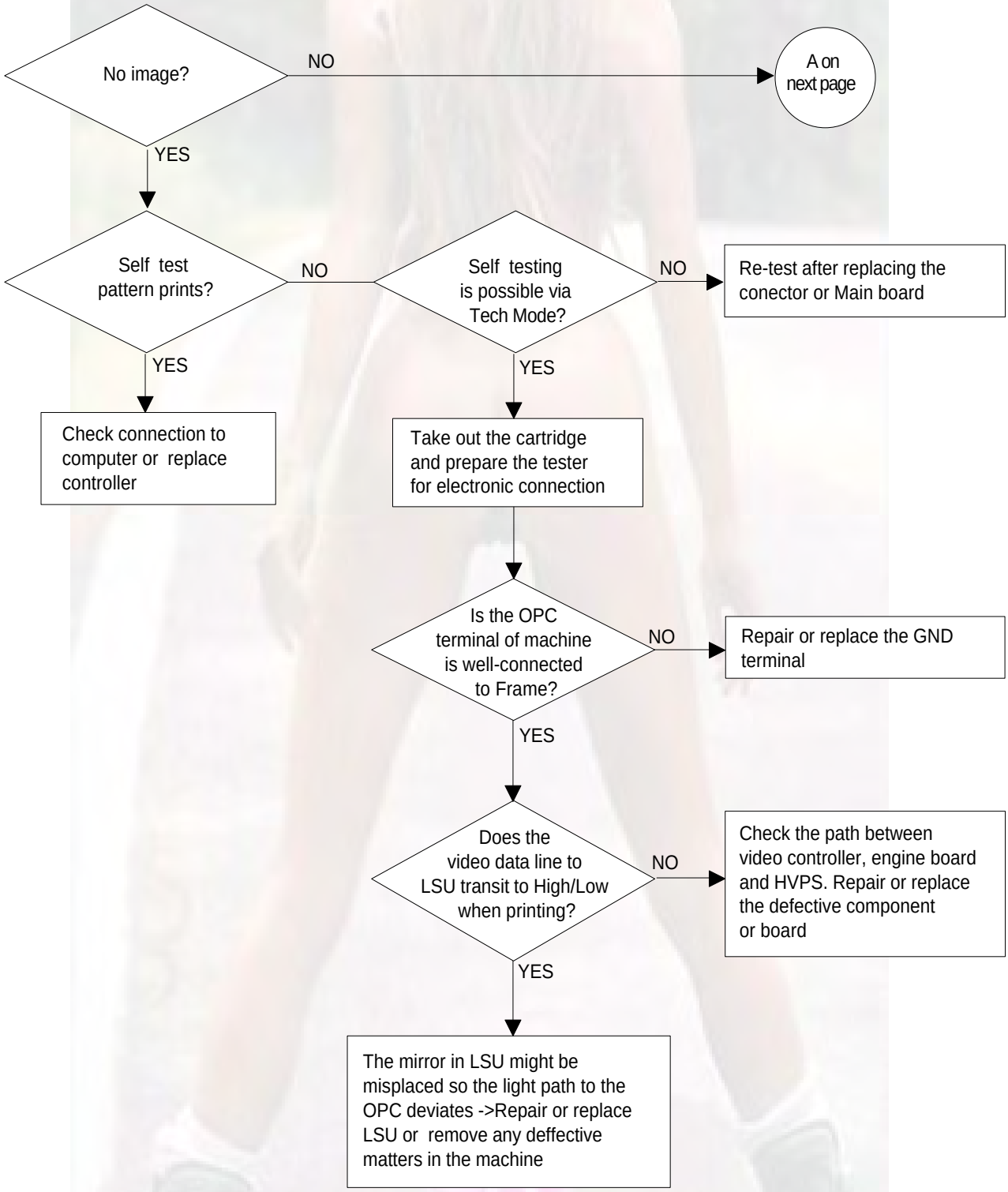
In this mode, the machine does all printing operation (demo page printing and printing the data from PC). If you diagnose the control board with malfunction printer engine, this mode is very useful.

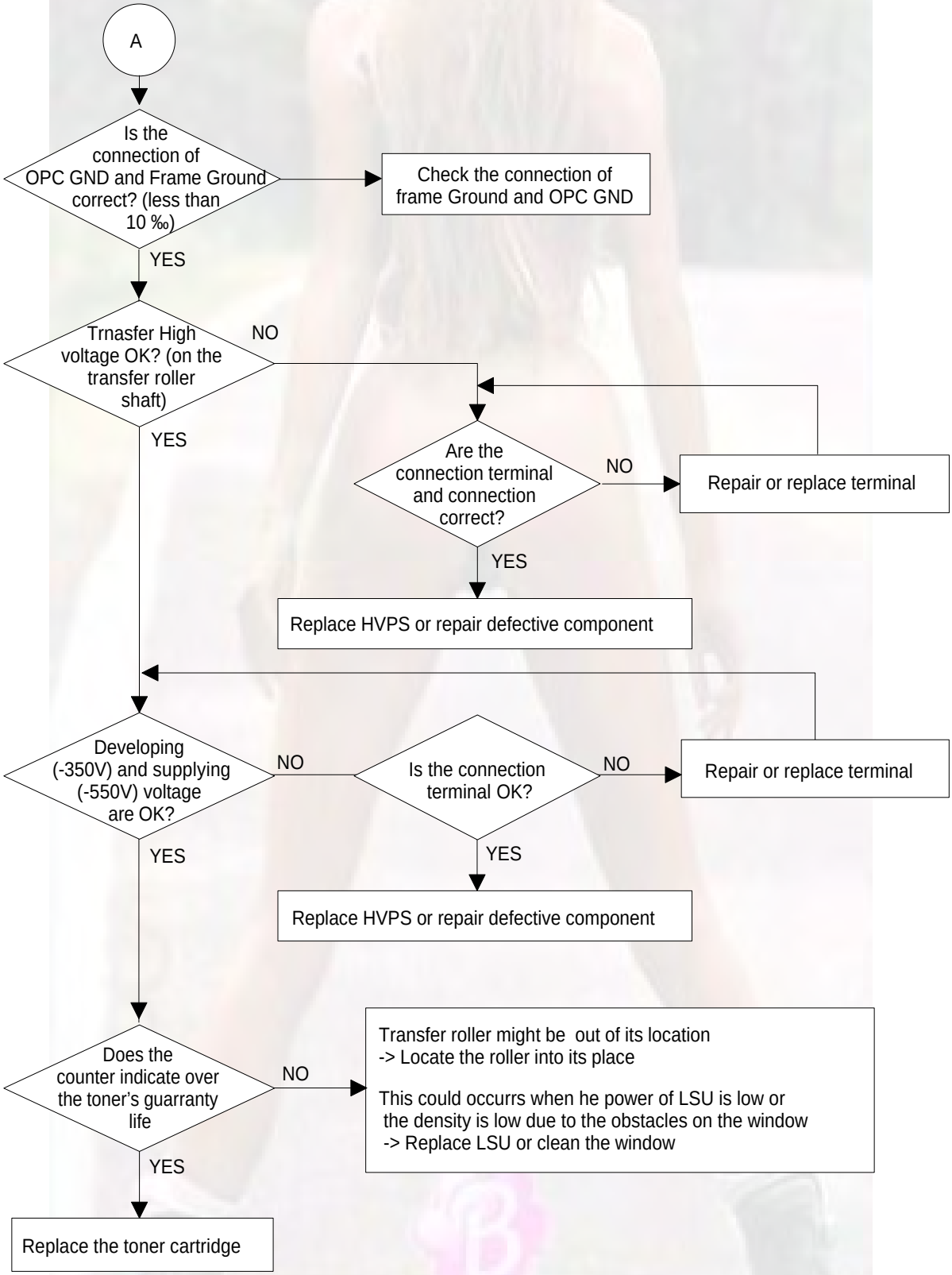
4-4 Troubleshooting Flow Chart

Vertical black line and band

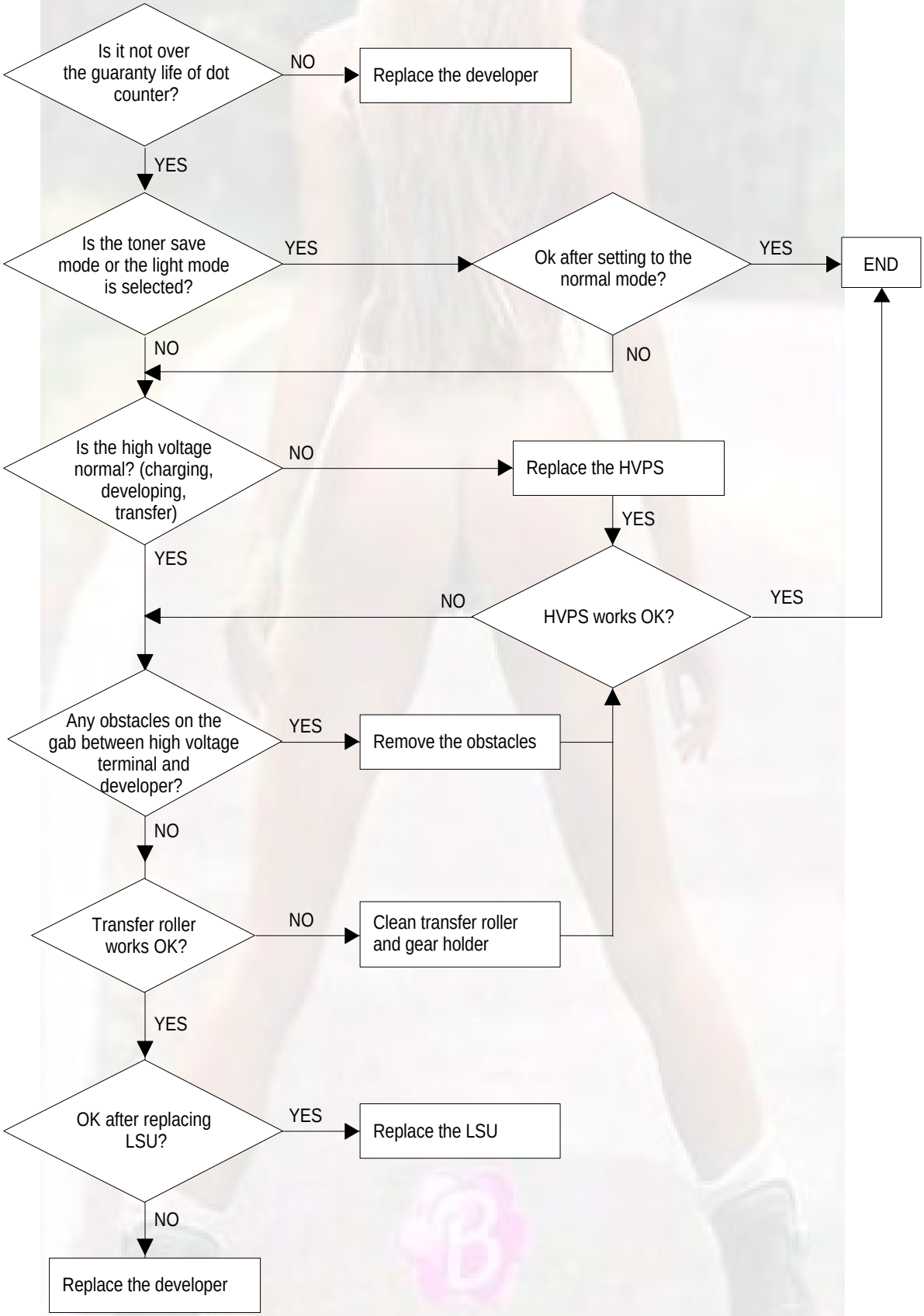


No Image

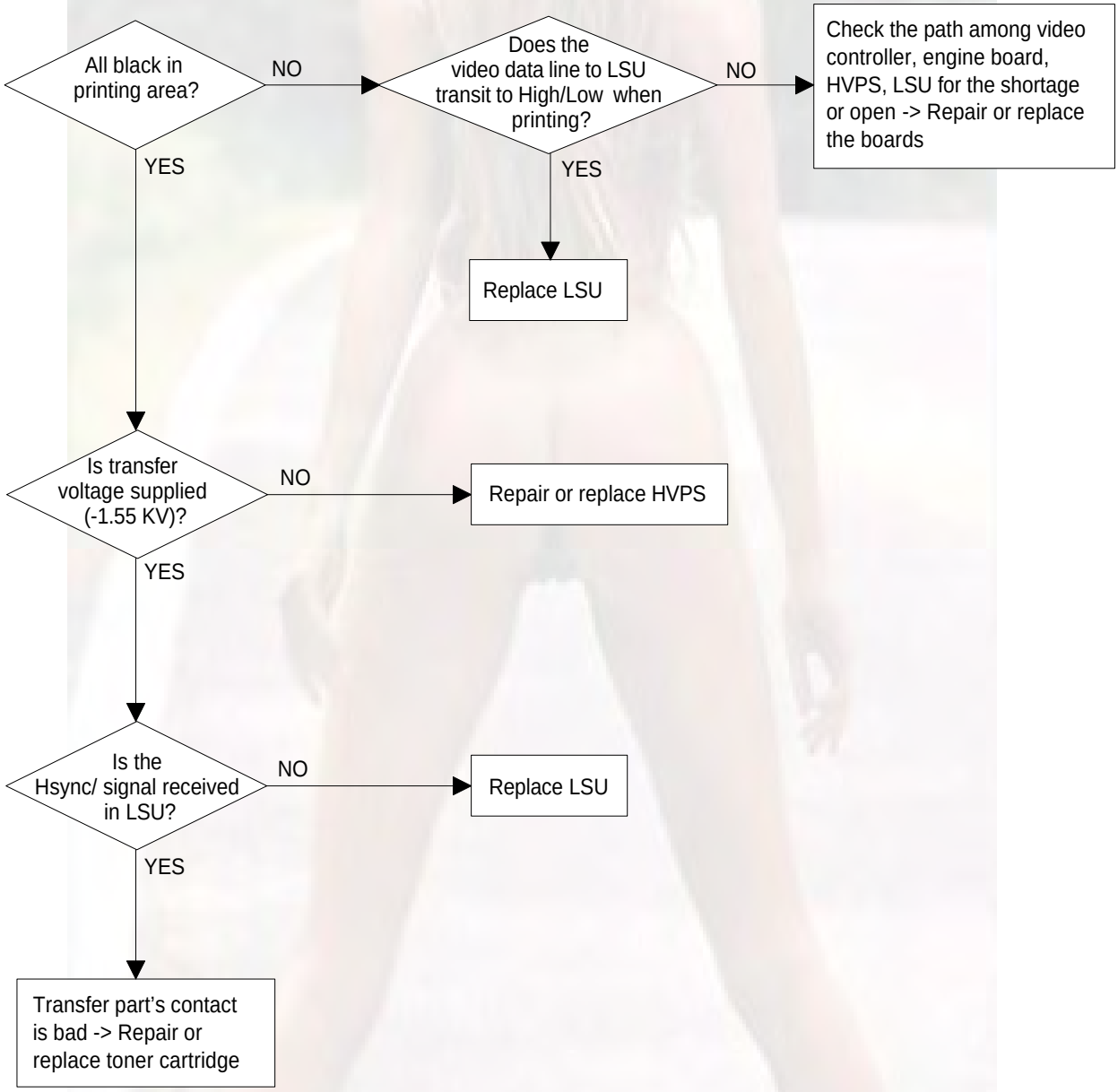

No image?
NO
A on next page
YES
Self test pattern prints?
NO
Self testing is possible via Tech Mode?
NO
Re-test after replacing the conector or Main board
YES
YES
Check connection to computer or replace controller
Take out the cartridge and prepare the tester for electronic connection
Is the OPC terminal of machine is well-connected to Frame?
NO
Repair or replace the GND terminal
YES
Does the video data line to LSU transit to High/Low when printing?
NO
Check the path between video controller, engine board and HVPS. Repair or replace the defective component or board
YES
The mirror in LSU might be misplaced so the light path to the OPC deviates ->Repair or replace LSU or remove any deffective matters in the machine


A
Is the connection of OPC GND and Frame Ground correct? (less than 10 ‰)
Check the connection of frame Ground and OPC GND
YES
Trnasfer High voltage OK? (on the transfer roller shaft)
NO
YES
Are the connection terminal and connection correct?
NO
Repair or replace terminal
YES
Replace HVPS or repair defective component
Developing (-350V) and supplying (-550V) voltage are OK?
NO
Is the connection terminal OK?
NO
Repair or replace terminal
YES
YES
Replace HVPS or repair defective component
Does the counter indicate over the toner's guarranty life
NO
Transfer roller might be out of its location
-> Locate the roller into its place
This could occurrs when he power of LSU is low or the density is low due to the obstacles on the window
-> Replace LSU or clean the window
YES
Replace the toner cartridge

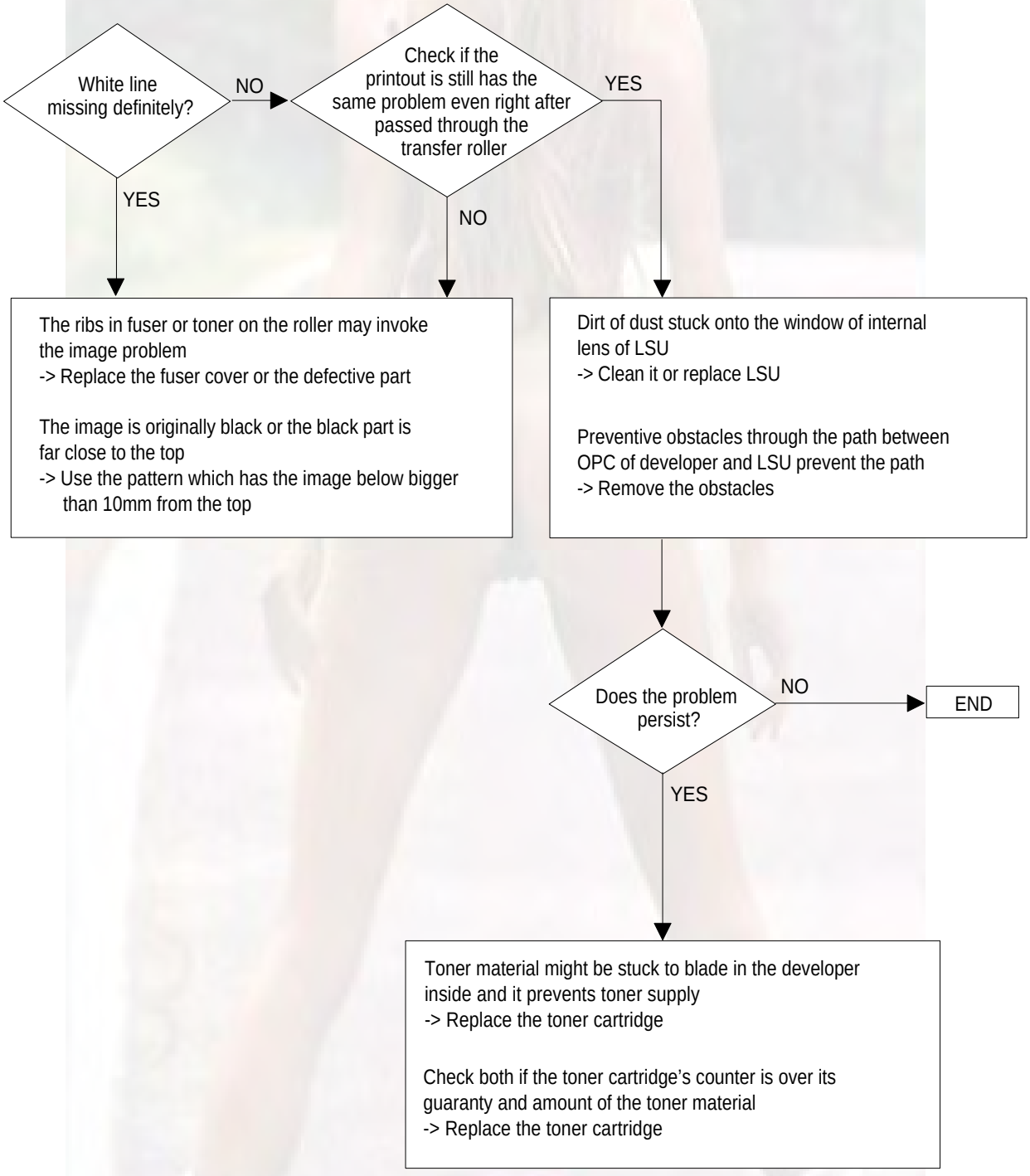
Light image


Is it not over the guaranty life of dot counter?
NO
Replace the developer
YES
Is the toner save mode or the light mode is selected?
YES
Ok after setting to the normal mode?
YES
END
NO
NO
Is the high voltage normal? (charging, developing, transfer)
NO
Replace the HVPS
YES
YES
NO
HVPS works OK?
YES
Any obstacles on the gab between high voltage terminal and developer?
YES
Remove the obstacles
NO
Transfer roller works OK?
NO
Clean transfer roller and gear holder
YES
OK after replacing LSU?
YES
Replace the LSU
NO
Replace the developer

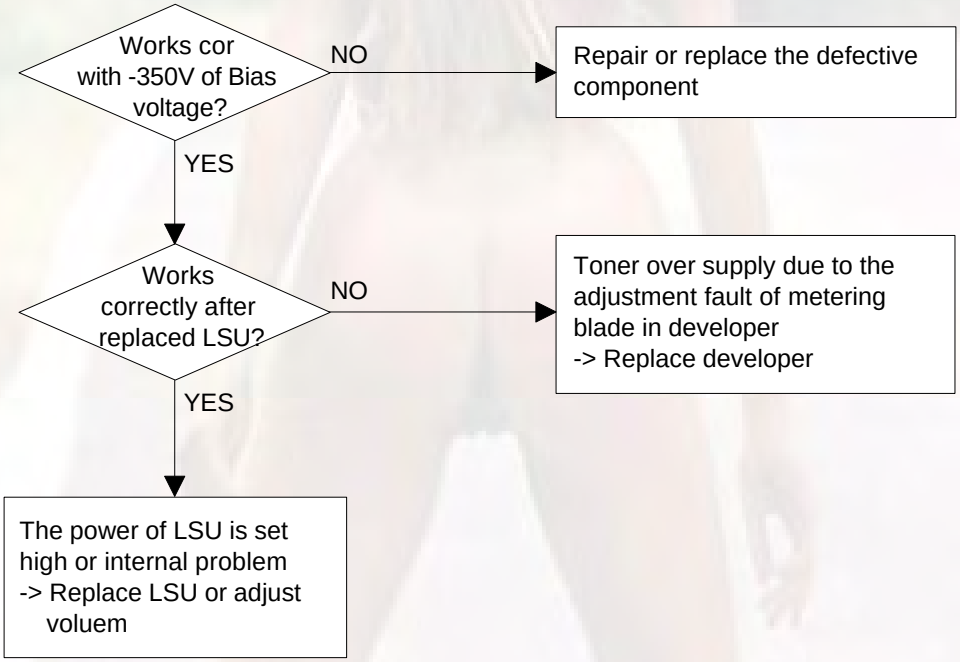
All Black


All black in printing area?
NO
Does the video data line to LSU transit to High/Low when printing?
NO
Check the path among video controller, engine board, HVPS, LSU for the shortage or open -> Repair or replace the boards
YES
YES
Replace LSU
Is transfer voltage supplied (-1.55 KV)?
NO
Repair or replace HVPS
YES
Is the Hsync/ signal received in LSU?
NO
Replace LSU
YES
Transfer part's contact is bad -> Repair or replace toner cartridge

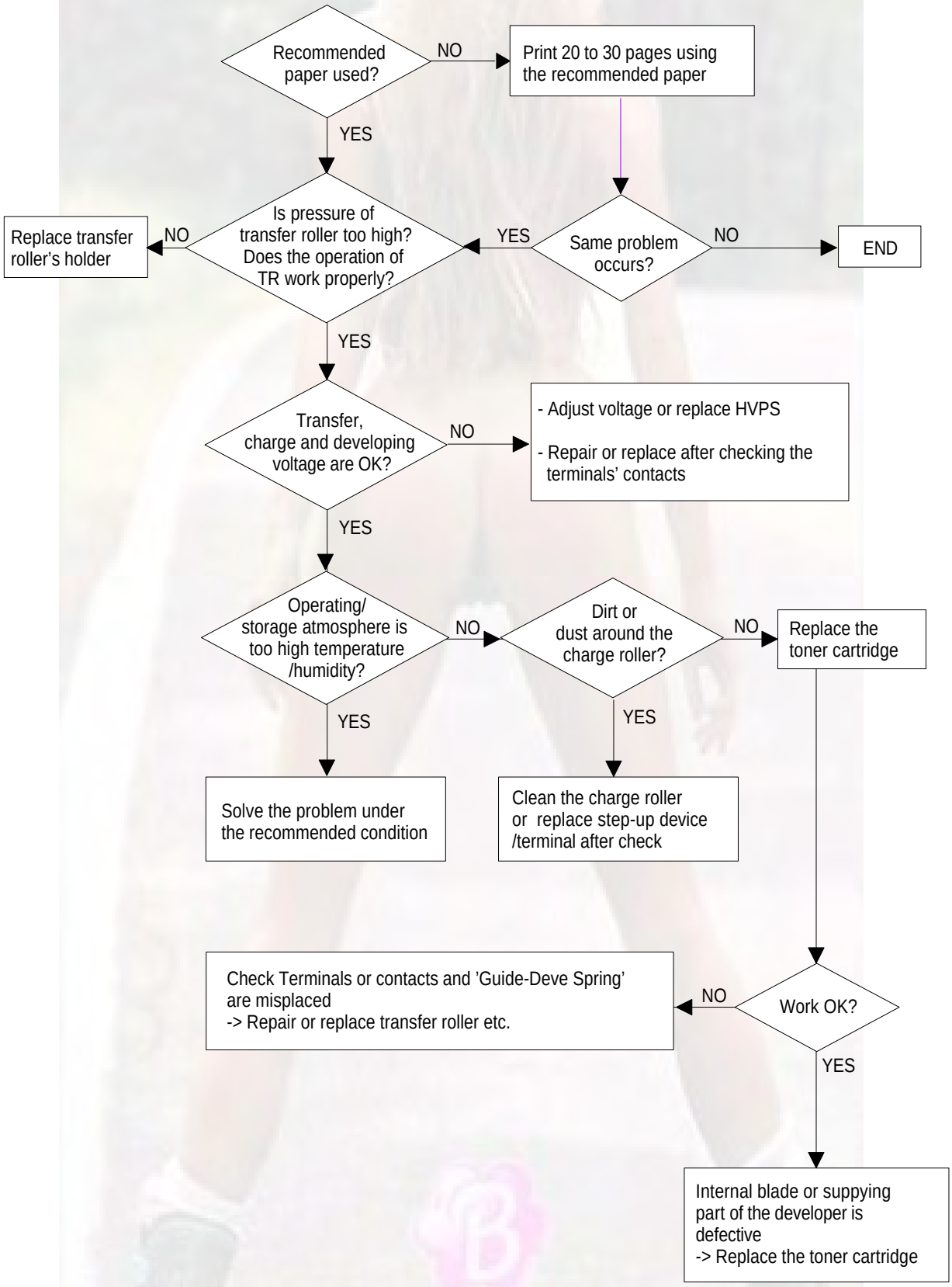
Vertical White Line (Band)


White line missing definitely?
NO
Check if the printout is still has the same problem even right after passed through the transfer roller
YES
YES
NO
The ribs in fuser or toner on the roller may invoke the image problem
-> Replace the fuser cover or the defective part
The image is originally black or the black part is far close to the top
-> Use the pattern which has the image below bigger than 10mm from the top
Dirt of dust stuck onto the window of internal lens of LSU
-> Clean it or replace LSU
Preventive obstacles through the path between OPC of developer and LSU prevent the path
-> Remove the obstacles
Does the problem persist?
NO
END
YES
Toner material might be stuck to blade in the developer inside and it prevents toner supply
-> Replace the toner cartridge
Check both if the toner cartridge's counter is over its guaranty and amount of the toner material
-> Replace the toner cartridge

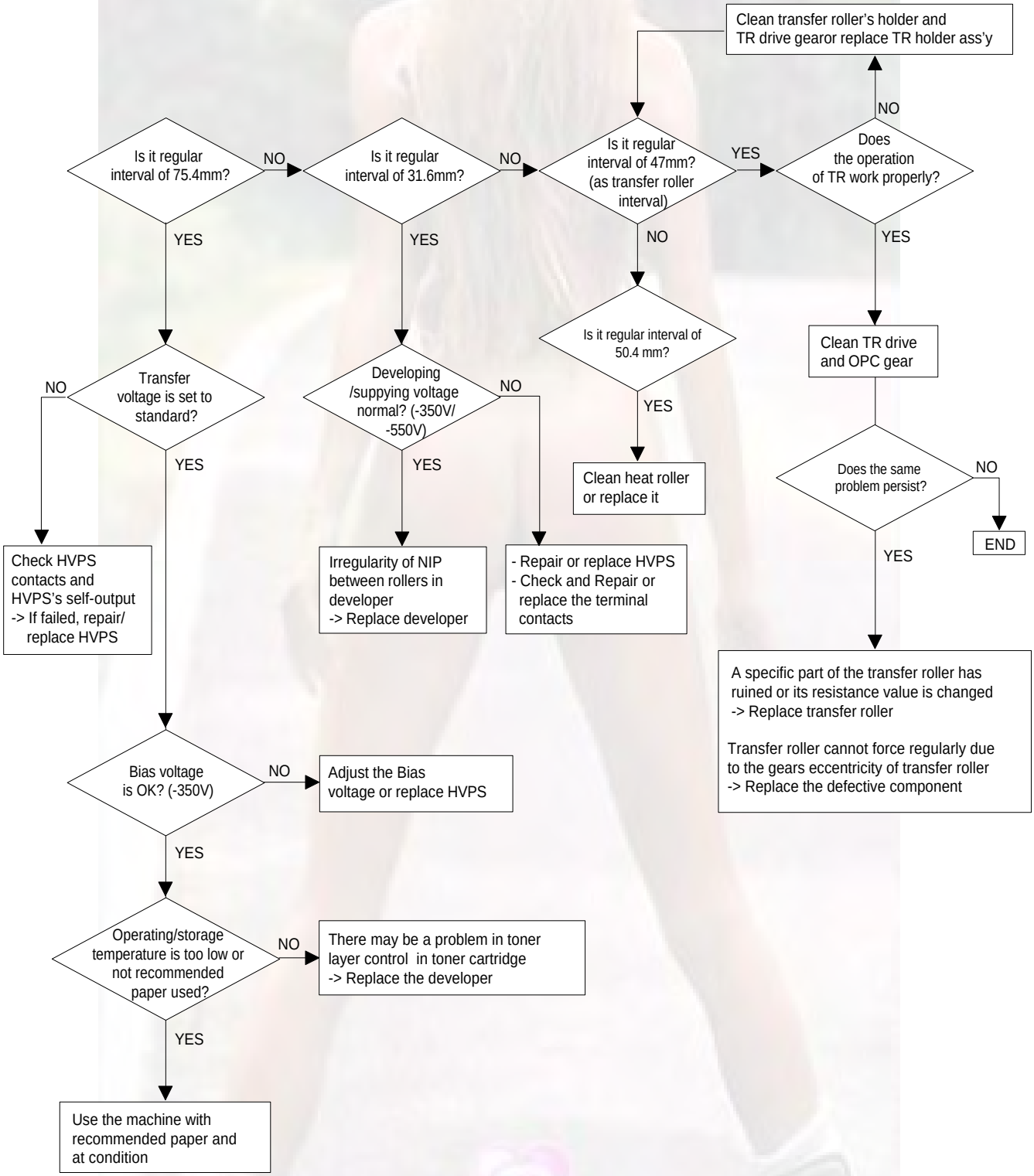
Dark Image


Works cor with -350V of Bias voltage?
NO
Repair or replace the defective component
YES
Works correctly after replaced LSU?
NO
Toner over supply due to the adjustment fault of metering blade in developer
-> Replace developer
YES
The power of LSU is set high or internal problem
-> Replace LSU or adjust voluem

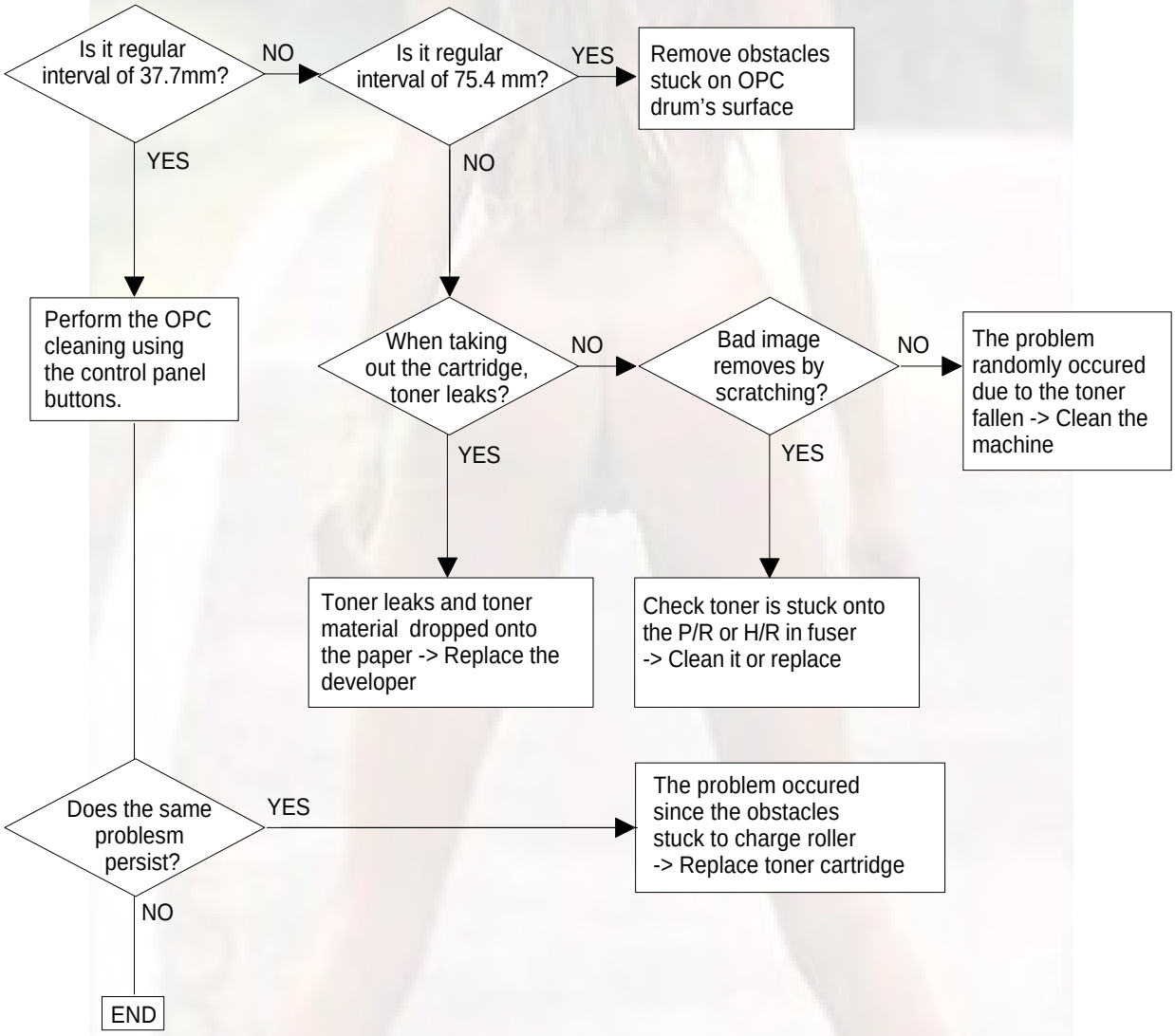
Background


Recommended paper used?
NO
Print 20 to 30 pages using the recommended paper
YES
Is pressure of transfer roller too high? Does the operation of TR work properly?
NO
Replace transfer roller's holder
YES
Same problem occurs?
NO
END
YES
Transfer, charge and developing voltage are OK?
NO
- Adjust voltage or replace HVPS
- Repair or replace after checking the terminals' contacts
YES
Operating/ storage atmosphere is too high temperature /humidity?
NO
Dirt or dust around the charge roller?
NO
Replace the toner cartridge
YES
YES
Solve the problem under the recommended condition
Clean the charge roller or replace step-up device /terminal after check
Check Terminals or contacts and 'Guide-Deve Spring' are misplaced
-> Repair or replace transfer roller etc.
NO
Work OK?
YES
Internal blade or suppying part of the developer is defective
-> Replace the toner cartridge

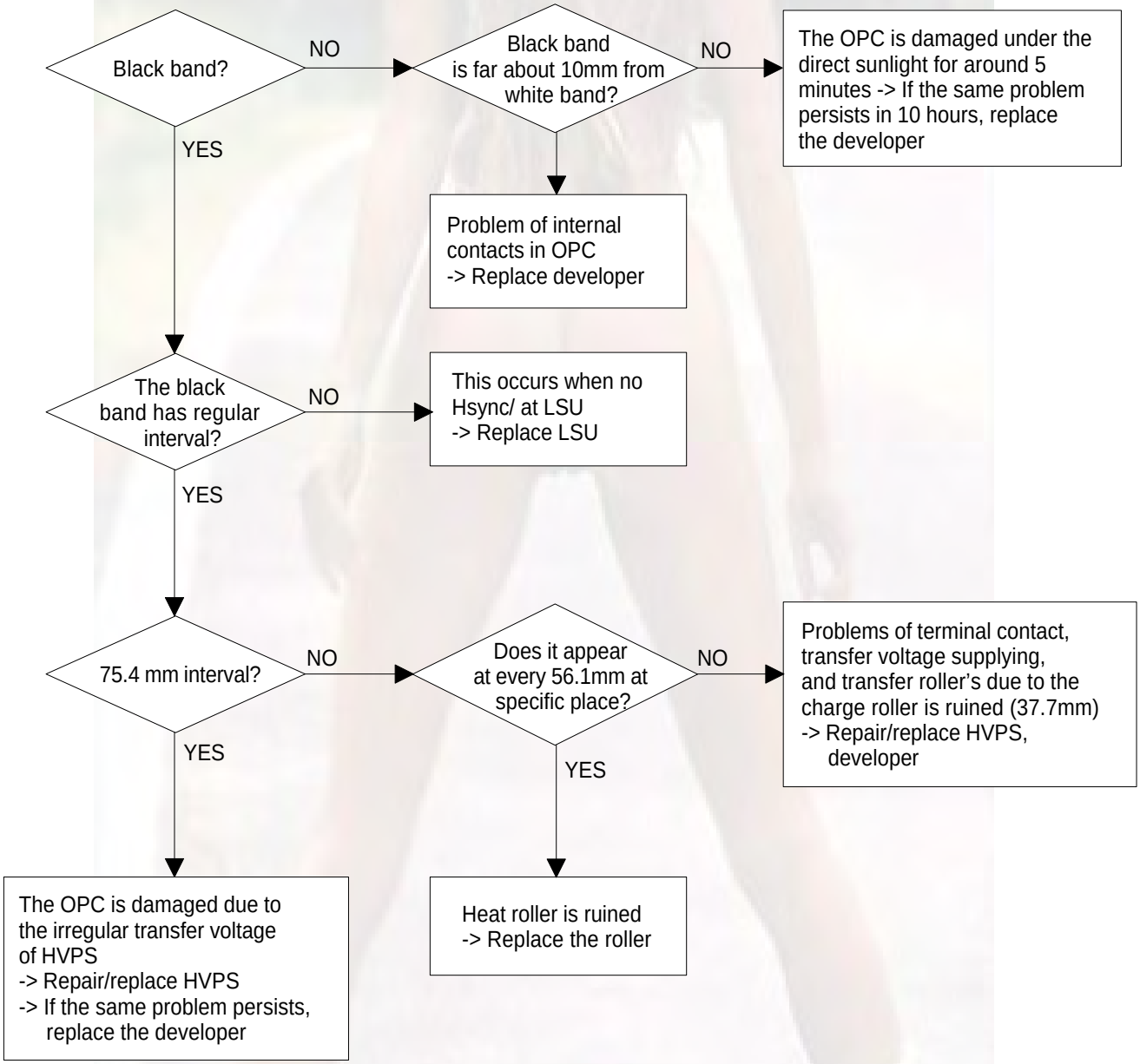
Ghost


Clean transfer roller's holder and TR drive gearor replace TR holder ass'y
Is it regular interval of 75.4mm?
NO
Is it regular interval of 31.6mm?
NO
Is it regular interval of 47mm? (as transfer roller interval)
YES
Does the operation of TR work properly?
NO
YES
YES
YES
NO
Is it regular interval of 50.4 mm?
Clean TR drive and OPC gear
Transfer voltage is set to standard?
NO
Developing /suppying voltage normal? (-350V/ -550V)
NO
YES
YES
YES
Clean heat roller or replace it
Does the same problem persist?
NO
END
YES
Check HVPS contacts and HVPS's self-output -> If failed, repair/ replace HVPS
Irregularity of NIP between rollers in developer -> Replace developer
- Repair or replace HVPS
- Check and Repair or replace the terminal contacts
A specific part of the transfer roller has ruined or its resistance value is changed -> Replace transfer roller
Transfer roller cannot force regularly due to the gears eccentricity of transfer roller -> Replace the defective component
Bias voltage is OK? (-350V)
NO
Adjust the Bias voltage or replace HVPS
YES
Operating/storage temperature is too low or not recommended paper used?
NO
There may be a problem in toner layer control in toner cartridge -> Replace the developer
YES
Use the machine with recommended paper and at condition

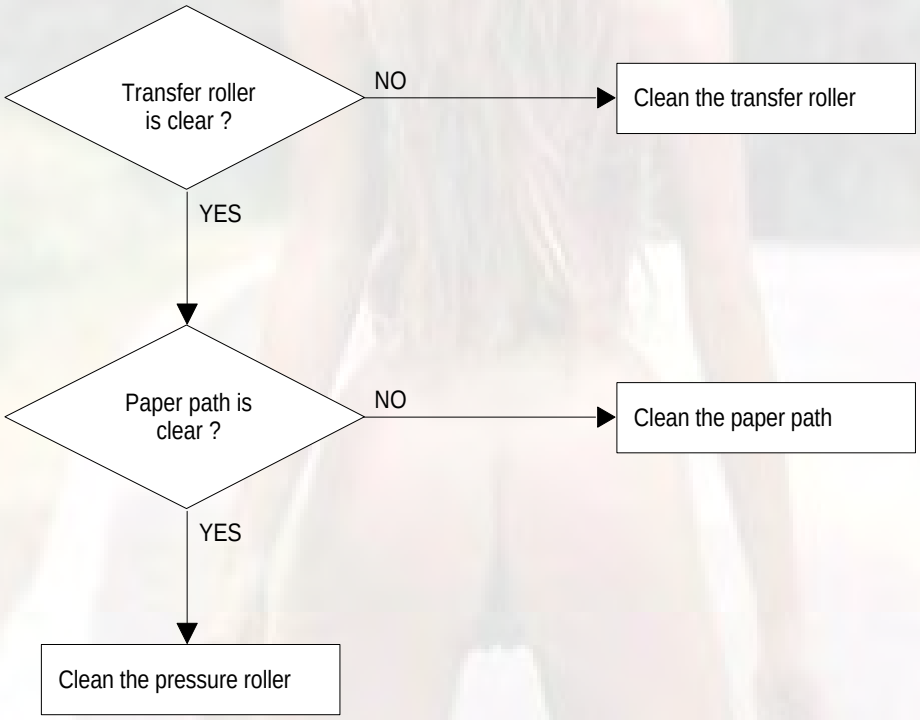
Black Spot


Is it regular interval of 37.7mm?
NO
Is it regular interval of 75.4 mm?
YES
Remove obstacles stuck on OPC drum's surface
YES
NO
Perform the OPC cleaning using the control panel buttons.
When taking out the cartridge, toner leaks?
NO
Bad image removes by scratching?
NO
The problem randomly occured due to the toner fallen -> Clean the machine
YES
YES
Toner leaks and toner material dropped onto the paper -> Replace the developer
Check toner is stuck onto the P/R or H/R in fuser -> Clean it or replace
Does the same problesm persist?
YES
The problem occured since the obstacles stuck to charge roller -> Replace toner cartridge
NO
END

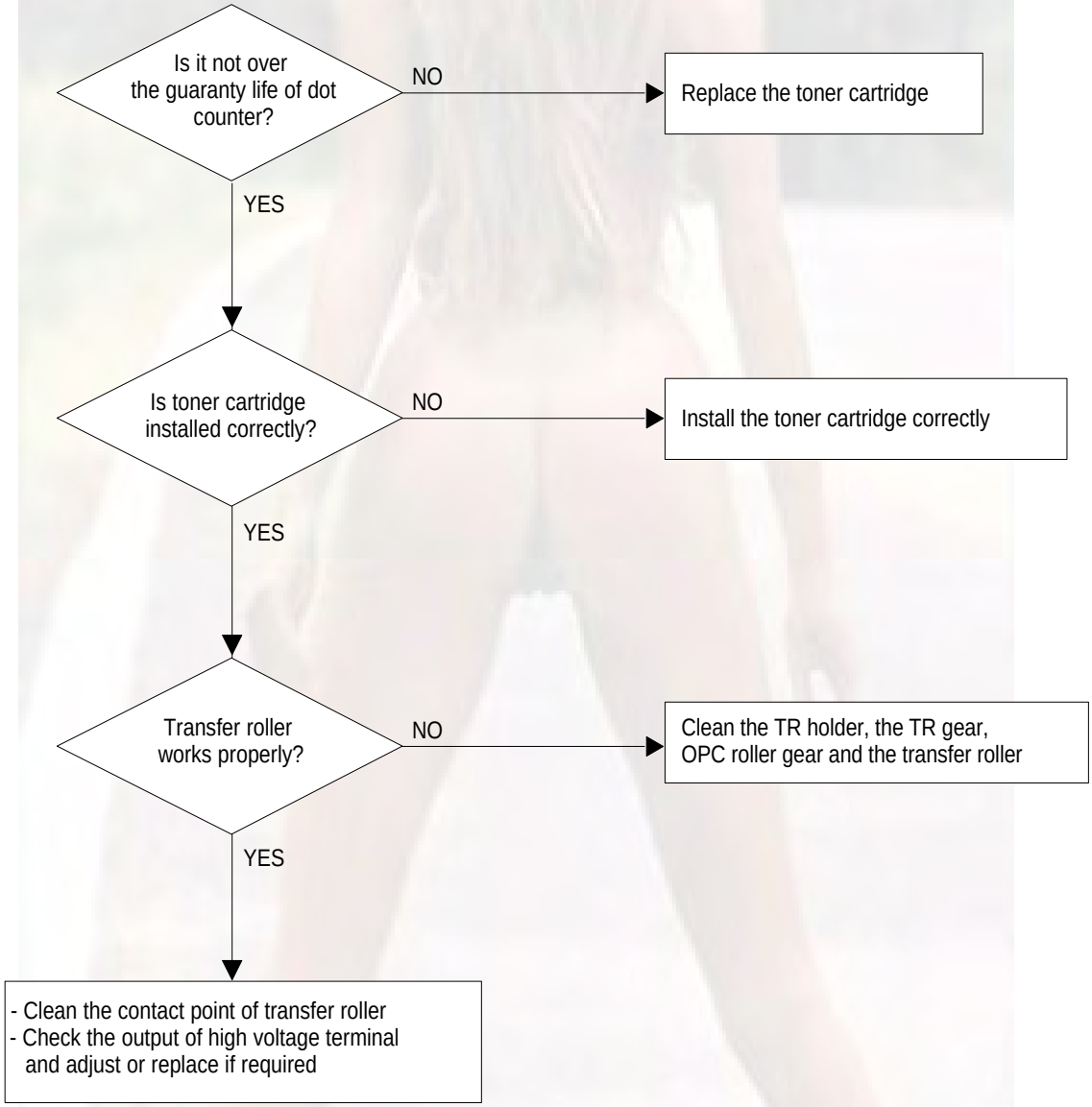
Horizontal Band


Black band?
NO
Black band is far about 10mm from white band?
NO
The OPC is damaged under the direct sunlight for around 5 minutes -> If the same problem persists in 10 hours, replace the developer
YES
Problem of internal contacts in OPC -> Replace developer
The black band has regular interval?
NO
This occurs when no Hsync/ at LSU -> Replace LSU
YES
75.4 mm interval?
NO
Does it appear at every 56.1mm at specific place?
NO
Problems of terminal contact, transfer voltage supplying, and transfer roller's due to the charge roller is ruined (37.7mm) -> Repair/replace HVPS, developer
YES
YES
The OPC is damaged due to the irregular transfer voltage of HVPS -> Repair/replace HVPS -> If the same problem persists, replace the developer
Heat roller is ruined -> Replace the roller

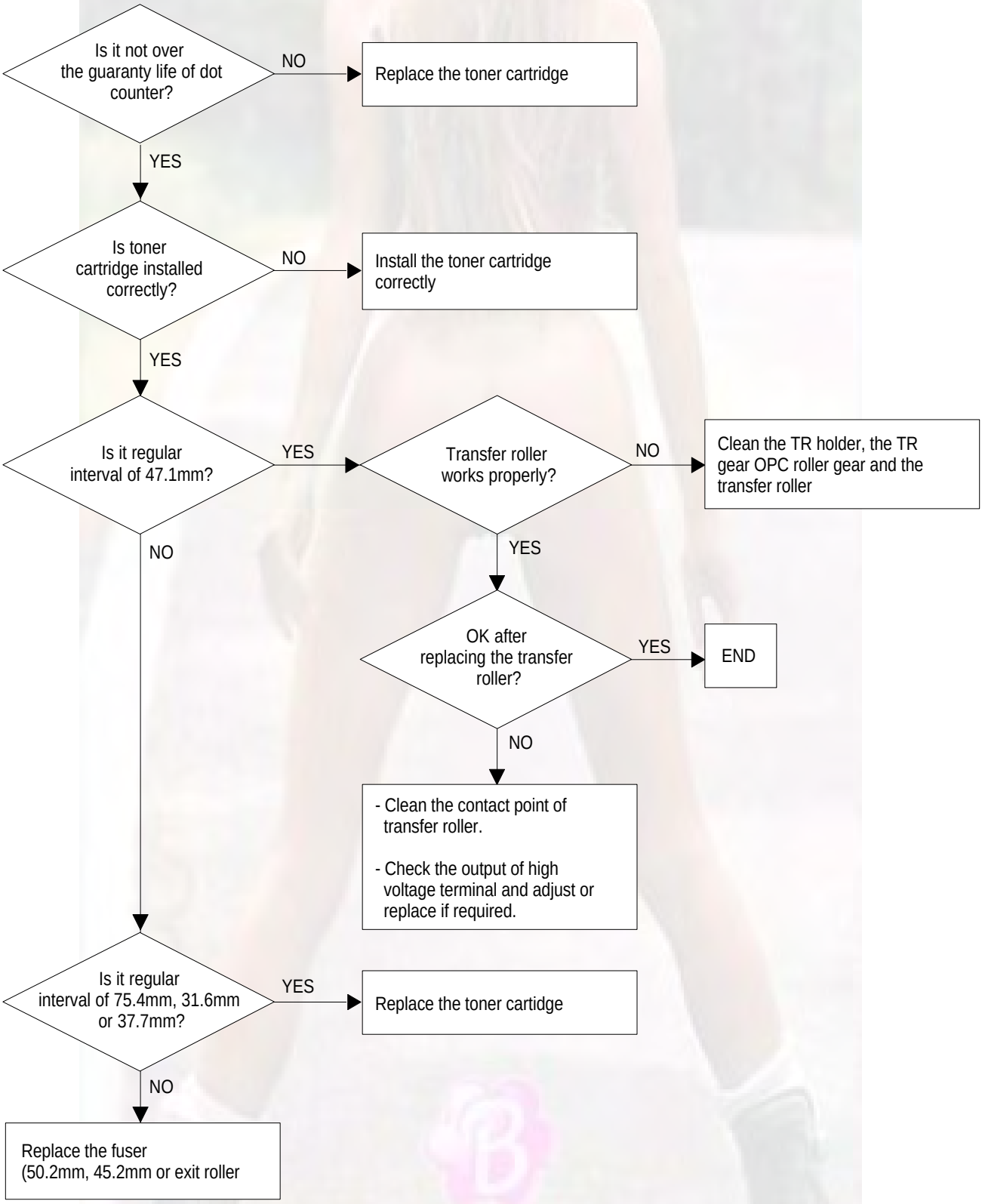
Toner Contaminations on Back of Paper



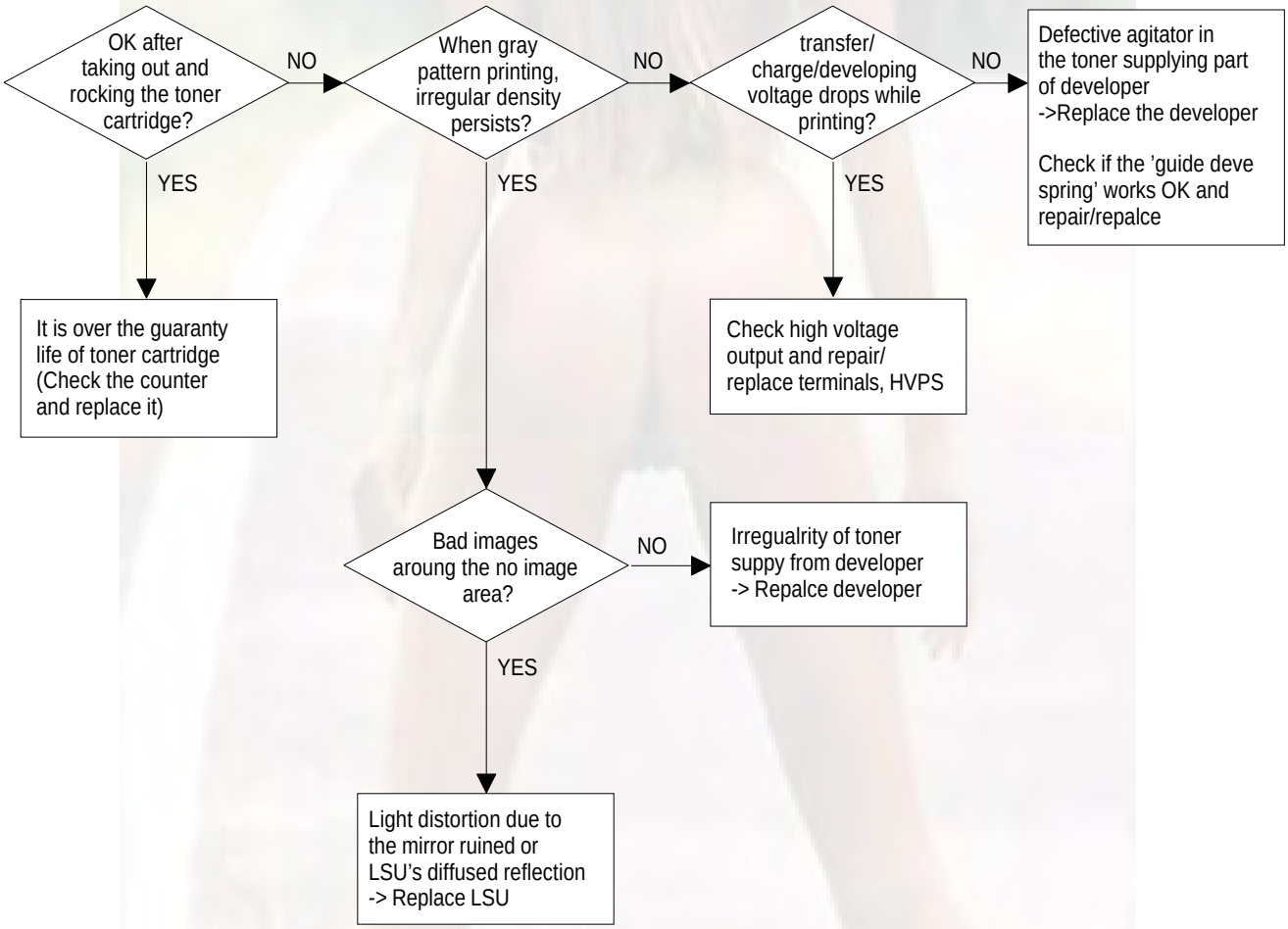
Partial Blank Image (not Periodic)


Is it not over the guaranty life of dot counter?
NO
Replace the toner cartridge
YES
Is toner cartridge installed correctly?
NO
Install the toner cartridge correctly
YES
Transfer roller works properly?
NO
Clean the TR holder, the TR gear, OPC roller gear and the transfer roller
YES
- Clean the contact point of transfer roller
- Check the output of high voltage terminal and adjust or replace if required

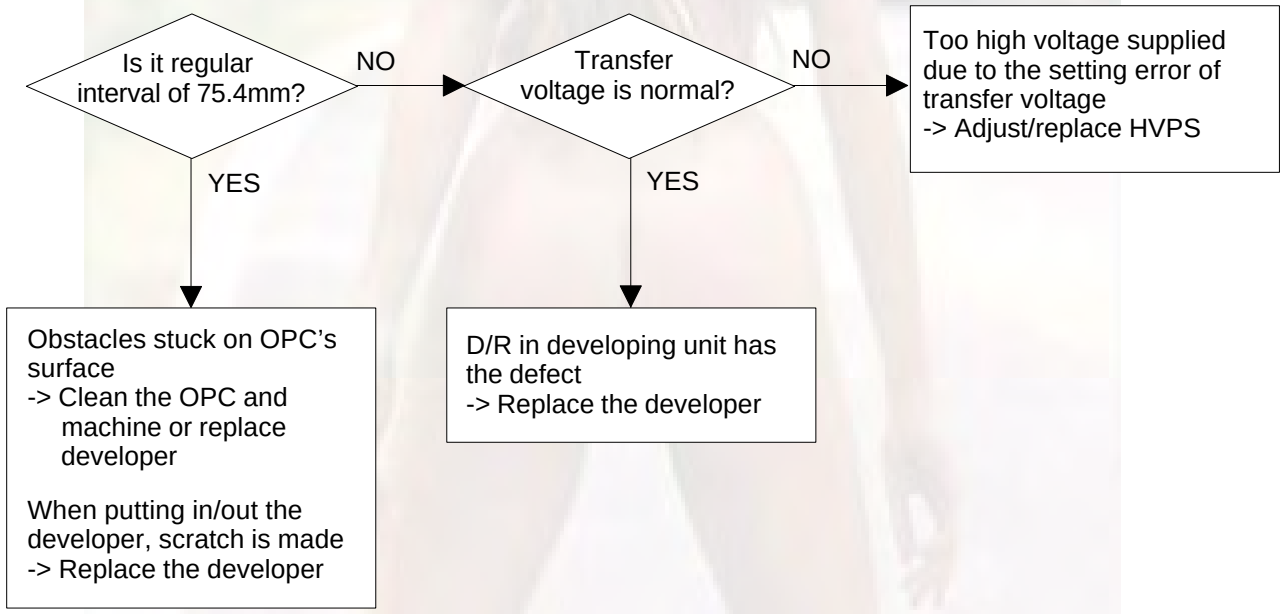
Partial Blank Image (Periodic)


Is it not over the guaranty life of dot counter?
NO
Replace the toner cartridge
YES
Is toner cartridge installed correctly?
NO
Install the toner cartridge correctly
YES
Is it regular interval of 47.1mm?
YES
Transfer roller works properly?
NO
Clean the TR holder, the TR gear OPC roller gear and the transfer roller
YES
NO
OK after replacing the transfer roller?
YES
END
NO
- Clean the contact point of transfer roller.
- Check the output of high voltage terminal and adjust or replace if required.
Is it regular interval of 75.4mm, 31.6mm or 37.7mm?
YES
Replace the toner cartidge
NO
Replace the fuser (50.2mm, 45.2mm or exit roller

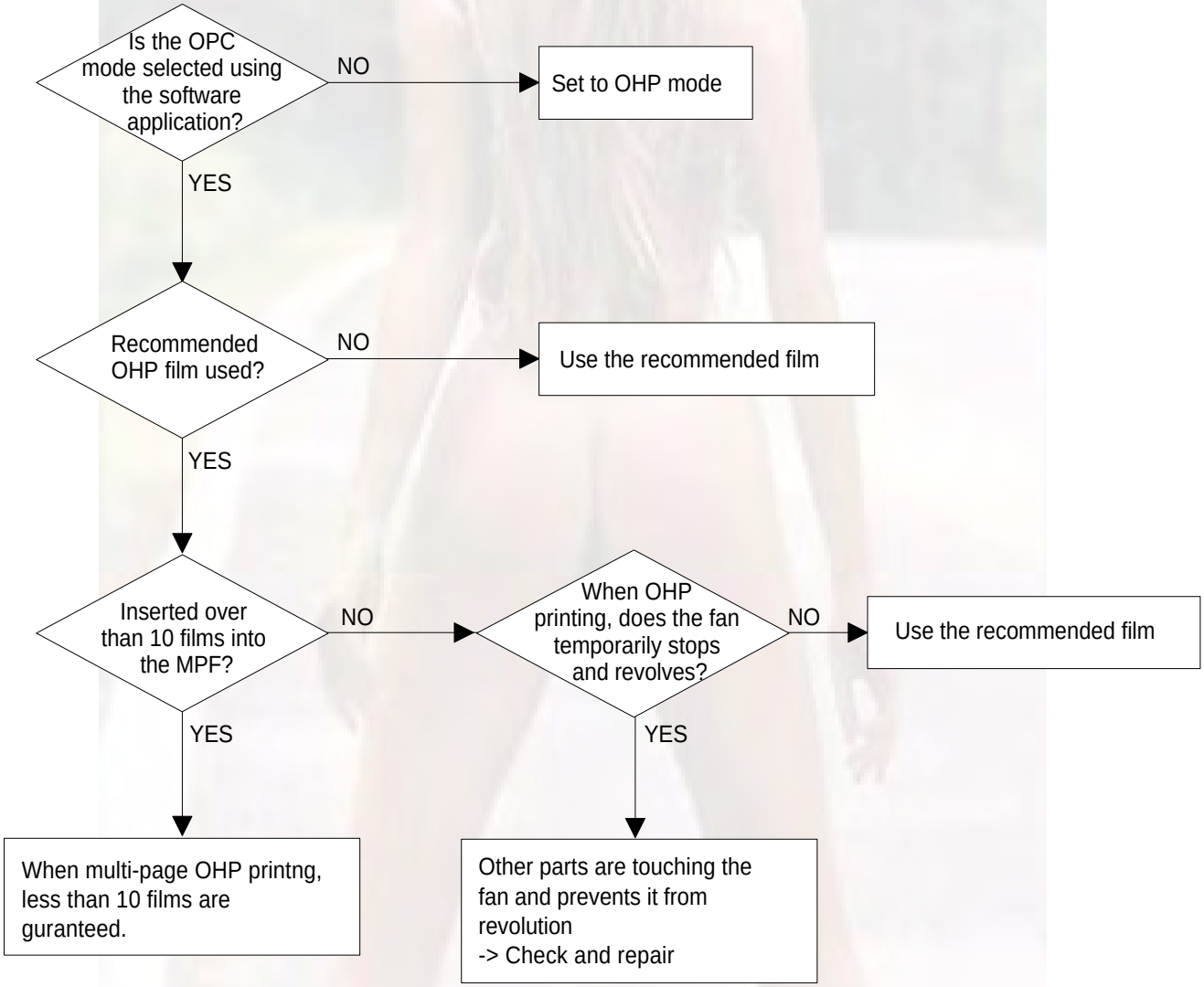
Irregular Density


OK after taking out and rocking the toner cartridge?
NO
When gray pattern printing, irregular density persists?
NO
transfer/ charge/developing voltage drops while printing?
NO
Defective agitator in the toner supplying part of developer
->Replace the developer
Check if the 'guide deve spring' works OK and repair/repalce
YES
YES
YES
It is over the guaranty life of toner cartridge (Check the counter and replace it)
Check high voltage output and repair/ replace terminals, HVPS
Bad images aroung the no image area?
NO
Irregualrity of toner suppy from developer
-> Repalce developer
YES
Light distortion due to the mirror ruined or LSU's diffused reflection
-> Replace LSU

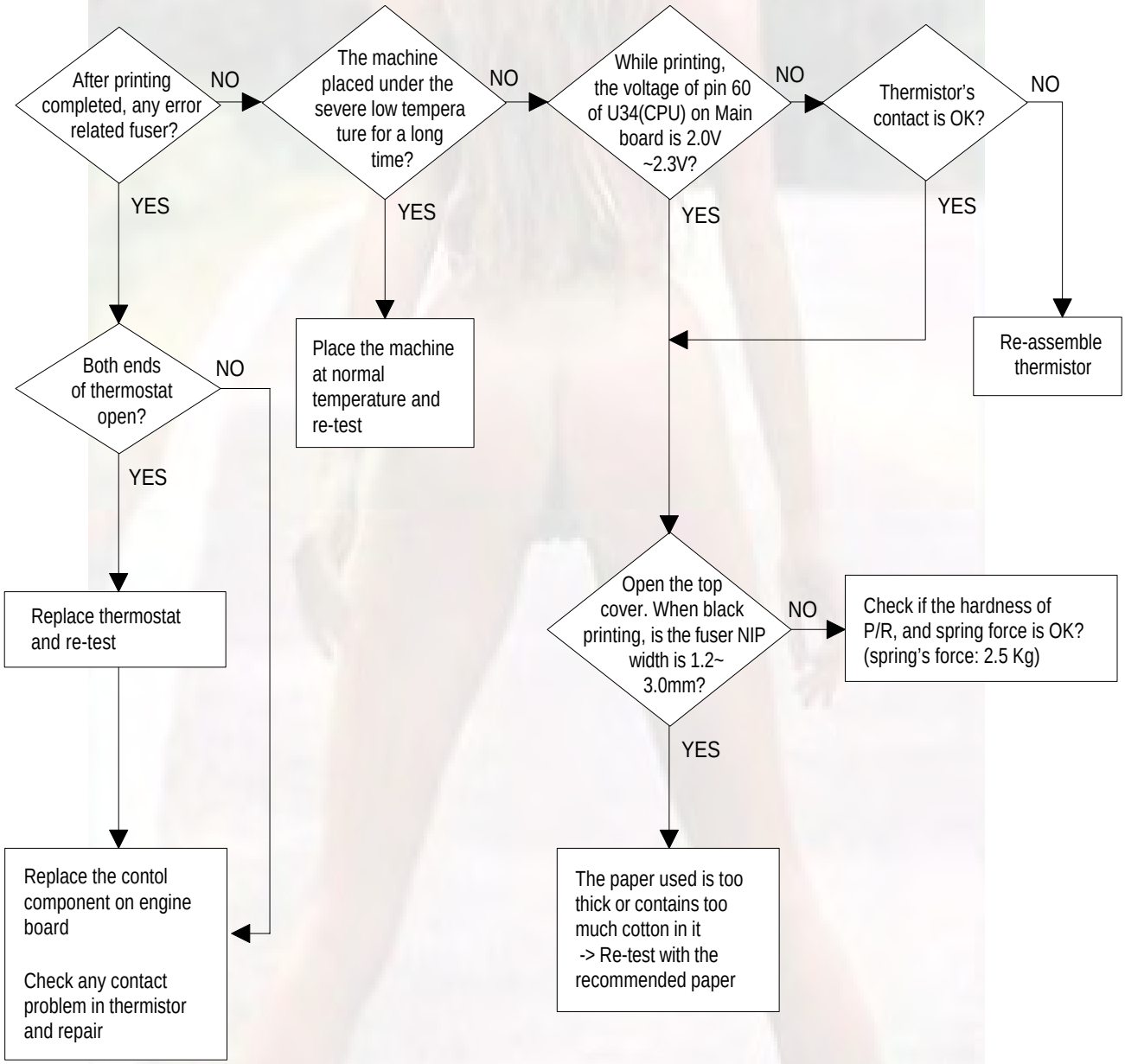
White Spot


Is it regular interval of 75.4mm?
NO
Transfer voltage is normal?
NO
Too high voltage supplied due to the setting error of transfer voltage
-> Adjust/replace HVPS
YES
YES
Obstacles stuck on OPC's surface
-> Clean the OPC and machine or replace developer
When putting in/out the developer, scratch is made
-> Replace the developer
D/R in developing unit has the defect
-> Replace the developer

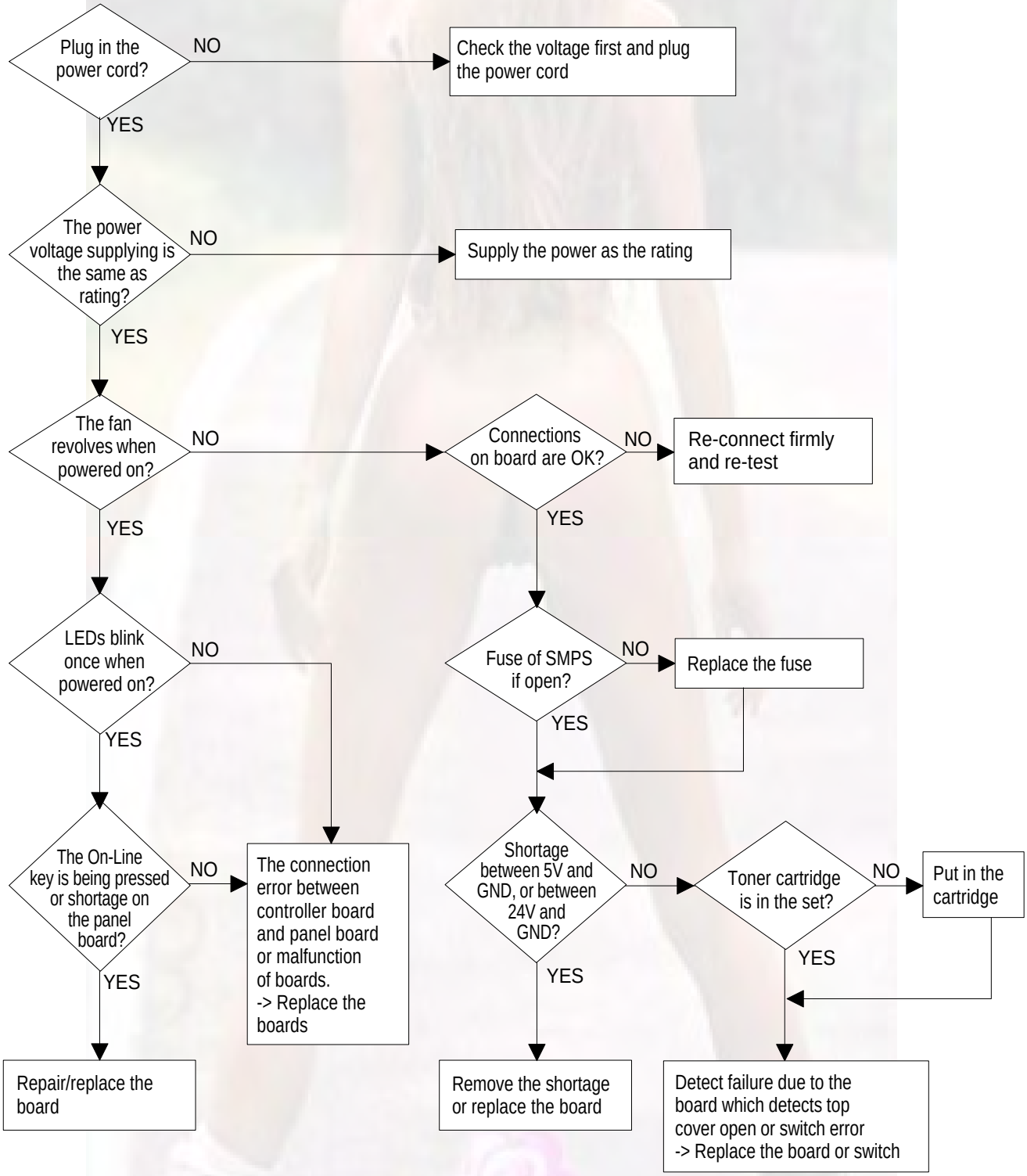
Trembling at the End When OHP Printing


Is the OPC mode selected using the software application?
NO
Set to OHP mode
YES
Recommended OHP film used?
NO
Use the recommended film
YES
Inserted over than 10 films into the MPF?
NO
When OHP printing, does the fan temporarily stops and revolves?
NO
Use the recommended film
YES
YES
When multi-page OHP printng, less than 10 films are guranteed.
Other parts are touching the fan and prevents it from revolution
-> Check and repair

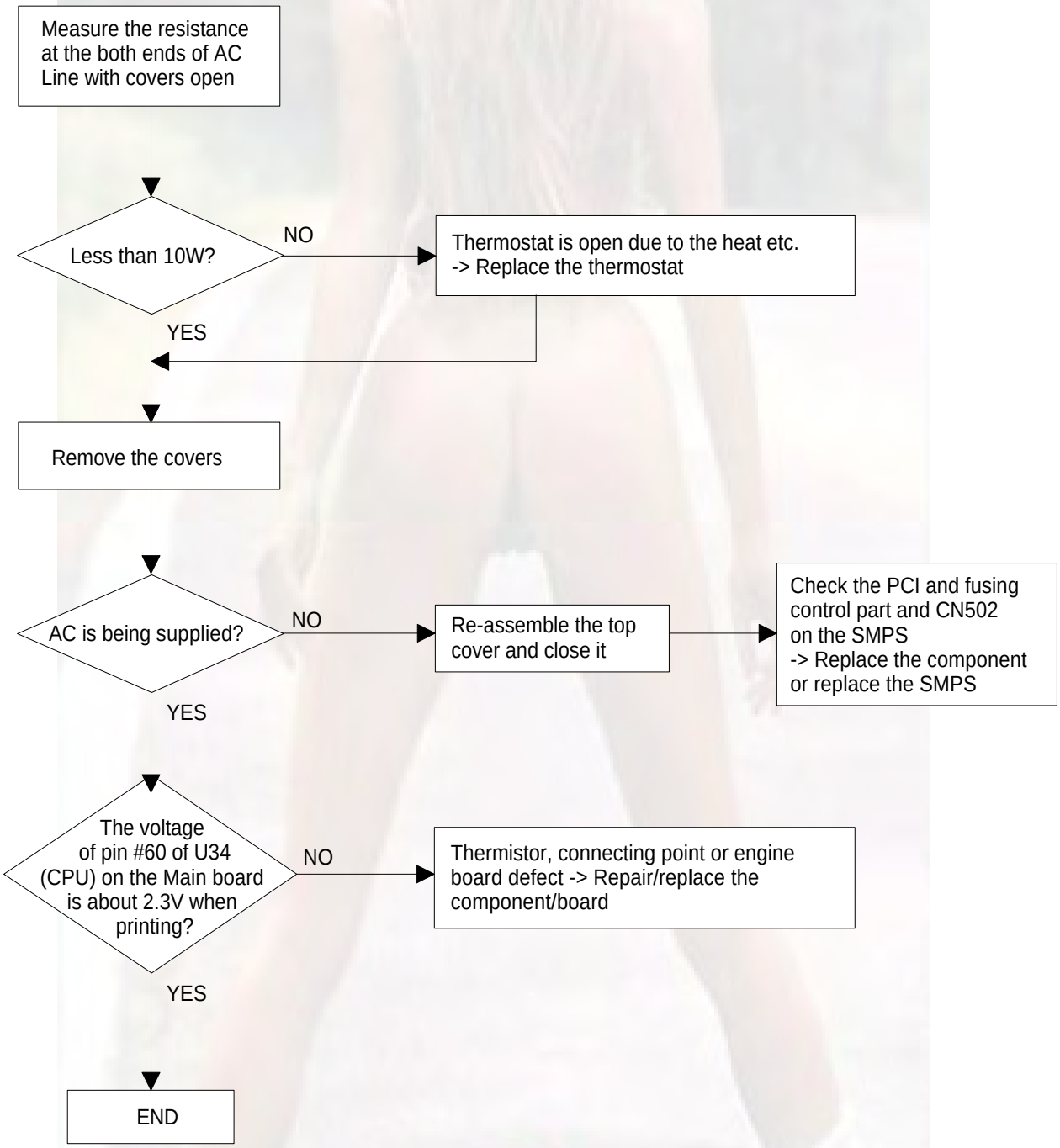
Poor Fusing Grade


After printing completed, any error related fuser?
NO
The machine placed under the severe low tempera ture for a long time?
NO
While printing, the voltage of pin 60 of U34(CPU) on Main board is 2.0V ~2.3V?
NO
Thermistor's contact is OK?
NO
YES
YES
YES
YES
Re-assemble thermistor
Place the machine at normal temperature and re-test
Both ends of thermostat open?
NO
YES
Replace thermostat and re-test
Open the top cover. When black printing, is the fuser NIP width is 1.2~ 3.0mm?
NO
Check if the hardness of P/R, and spring force is OK? (spring's force: 2.5 Kg)
YES
Replace the contol component on engine board
Check any contact problem in thermistor and repair
The paper used is too thick or contains too much cotton in it
-> Re-test with the recommended paper

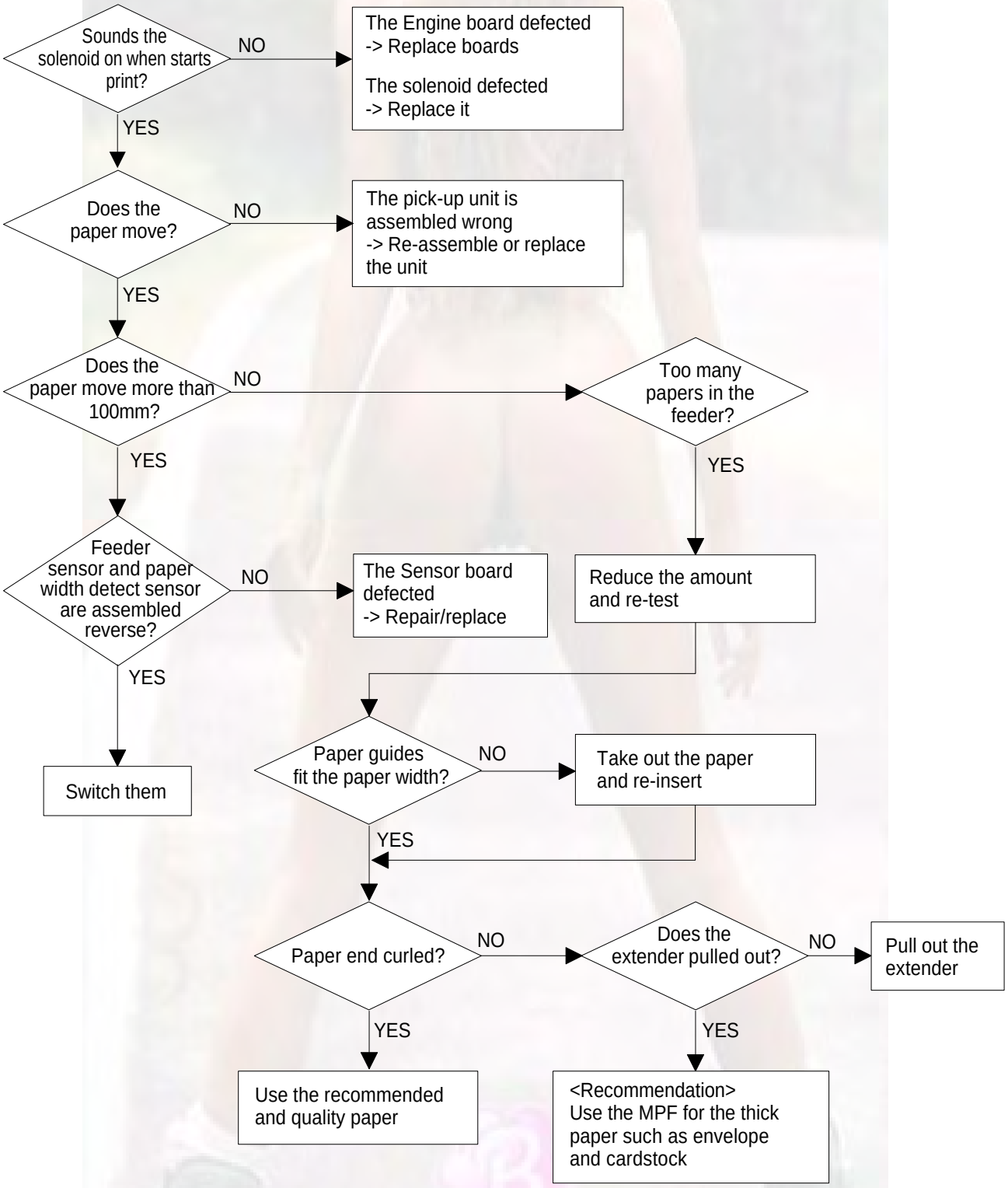
No Power (LED Off)


Plug in the power cord?
NO
Check the voltage first and plug the power cord
YES
The power voltage supplying is the same as rating?
NO
Supply the power as the rating
YES
The fan revolves when powered on?
NO
Connections on board are OK?
NO
Re-connect firmly and re-test
YES
YES
LEDs blink once when powered on?
NO
Fuse of SMPS if open?
NO
Replace the fuse
YES
YES
The On-Line key is being pressed or shortage on the panel board?
NO
The connection error between controller board and panel board or malfunction of boards.
-> Replace the boards
Shortage between 5V and GND, or between 24V and GND?
NO
Toner cartridge is in the set?
NO
Put in the cartridge
YES
YES
YES
Repair/replace the board
Remove the shortage or replace the board
Detect failure due to the board which detects top cover open or switch error
-> Replace the board or switch

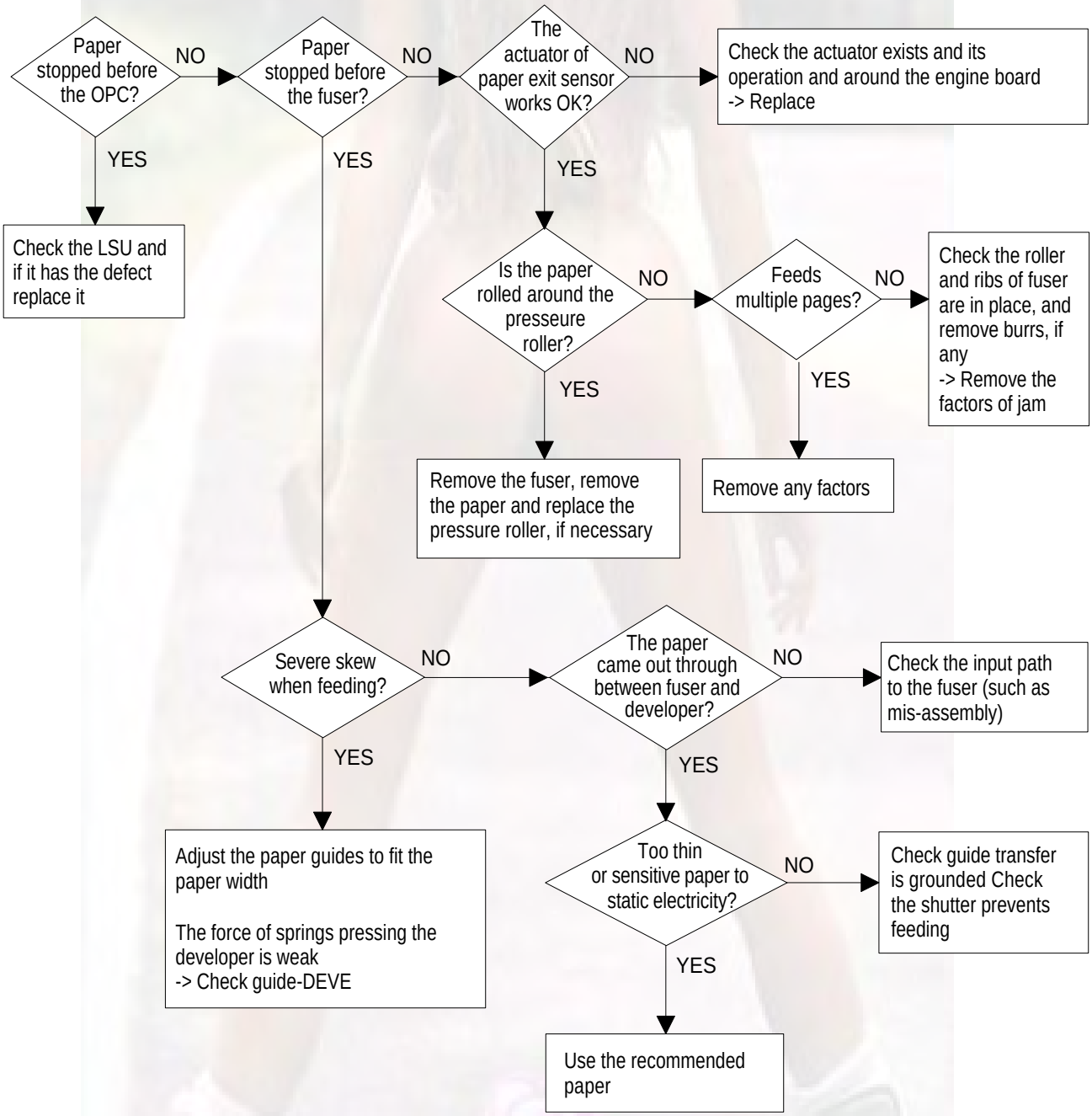
Fuser Error


Measure the resistance at the both ends of AC Line with covers open
Less than 10W?
NO
Thermostat is open due to the heat etc.
-> Replace the thermostat
YES
Remove the covers
AC is being supplied?
NO
Re-assemble the top cover and close it
Check the PCI and fusing control part and CN502 on the SMPS
-> Replace the component or replace the SMPS
YES
The voltage of pin #60 of U34 (CPU) on the Main board is about 2.3V when printing?
NO
Thermistor, connecting point or engine board defect -> Repair/replace the component/board
YES
END

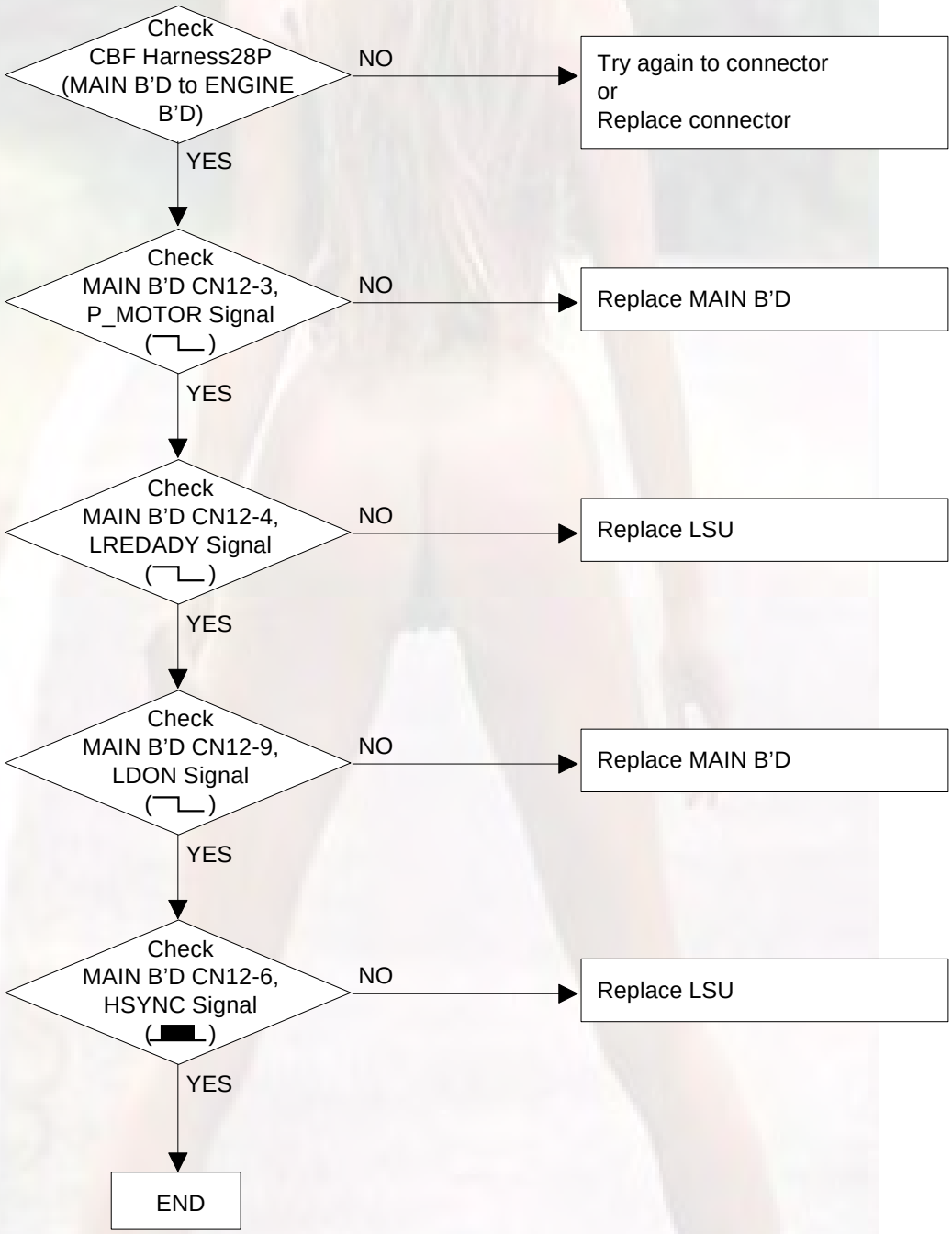
Paper Jam (Mis-feeding)



Paper Jam (Jam1)


Paper stopped before the OPC?
NO
Paper stopped before the fuser?
NO
The actuator of paper exit sensor works OK?
NO
Check the actuator exists and its operation and around the engine board -> Replace
YES
YES
YES
Check the LSU and if it has the defect replace it
Is the paper rolled around the presseure roller?
NO
Feeds multiple pages?
NO
Check the roller and ribs of fuser are in place, and remove burrs, if any -> Remove the factors of jam
YES
YES
Remove the fuser, remove the paper and replace the pressure roller, if necessary
Remove any factors
Severe skew when feeding?
NO
The paper came out through between fuser and developer?
NO
Check the input path to the fuser (such as mis-assembly)
YES
YES
Adjust the paper guides to fit the paper width
The force of springs pressing the developer is weak -> Check guide-DEVE
Too thin or sensitive paper to static electricity?
NO
Check guide transfer is grounded Check the shutter prevents feeding
YES
Use the recommended paper

LSU Error


Check
CBF Harness28P
(MAIN B'D to ENGINE
B'D)
NO
Try again to connector
or
Replace connector
YES
Check
MAIN B'D CN12-3,
P_MOTOR Signal
NO
Replace MAIN B'D
YES
Check
MAIN B'D CN12-4,
LREDADY Signal
NO
Replace LSU
YES
Check
MAIN B'D CN12-9,
LDON Signal
NO
Replace MAIN B'D
YES
Check
MAIN B'D CN12-6,
HSYNC Signal
NO
Replace LSU
YES
END

Memo

5. Exploded Views and Parts Lists

5-1 Main Exploded View

5-2 Front Exploded View

5-3 Engine/Frame Lower Exploded View

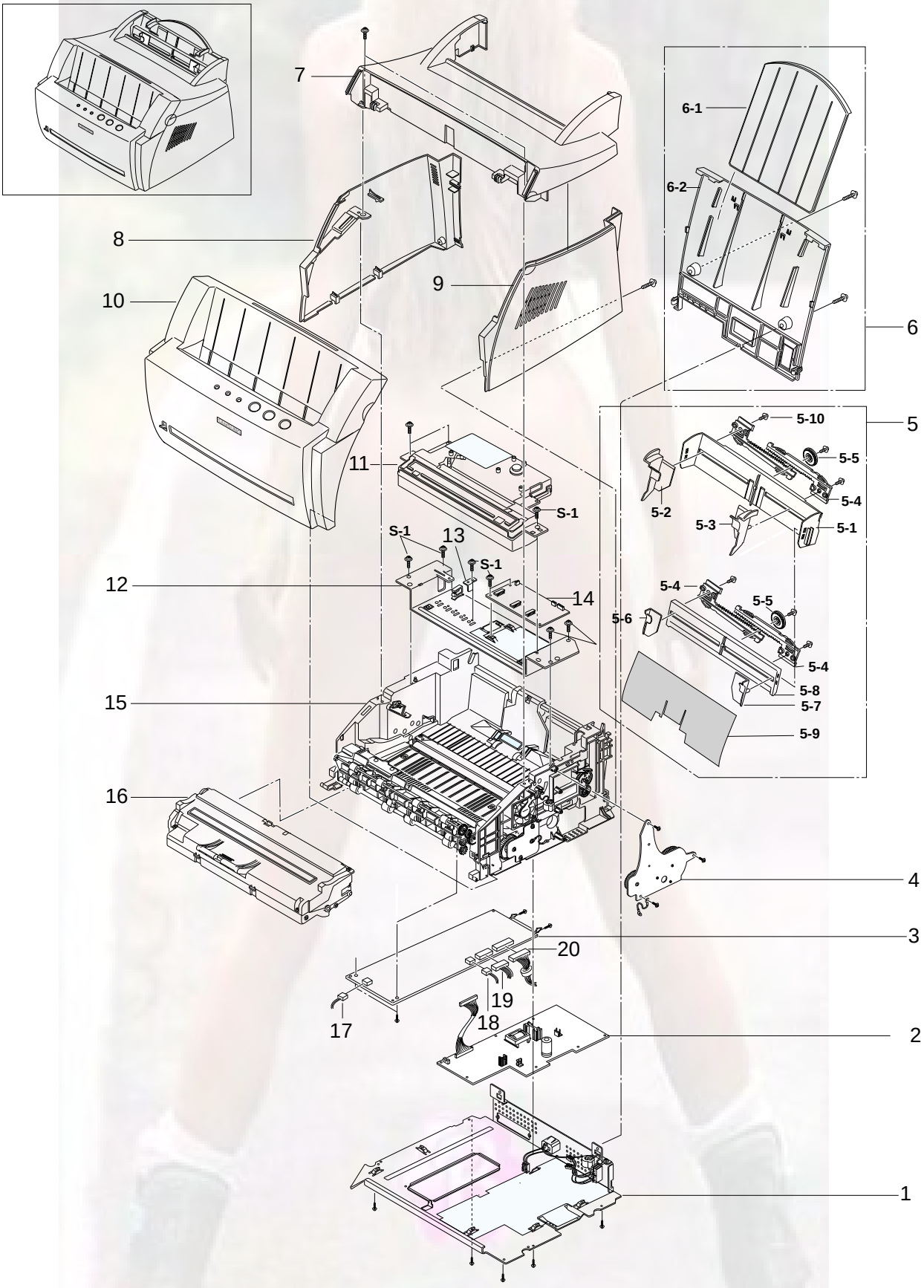
5-4 Fuser Exploded View

5-5 Shield Engine Unit Exploded View

5-6 RX Drive Exploded View

5-7 Plate-Upper Unit Exploded View

5-1 Main Exploded View



Main Parts Lists

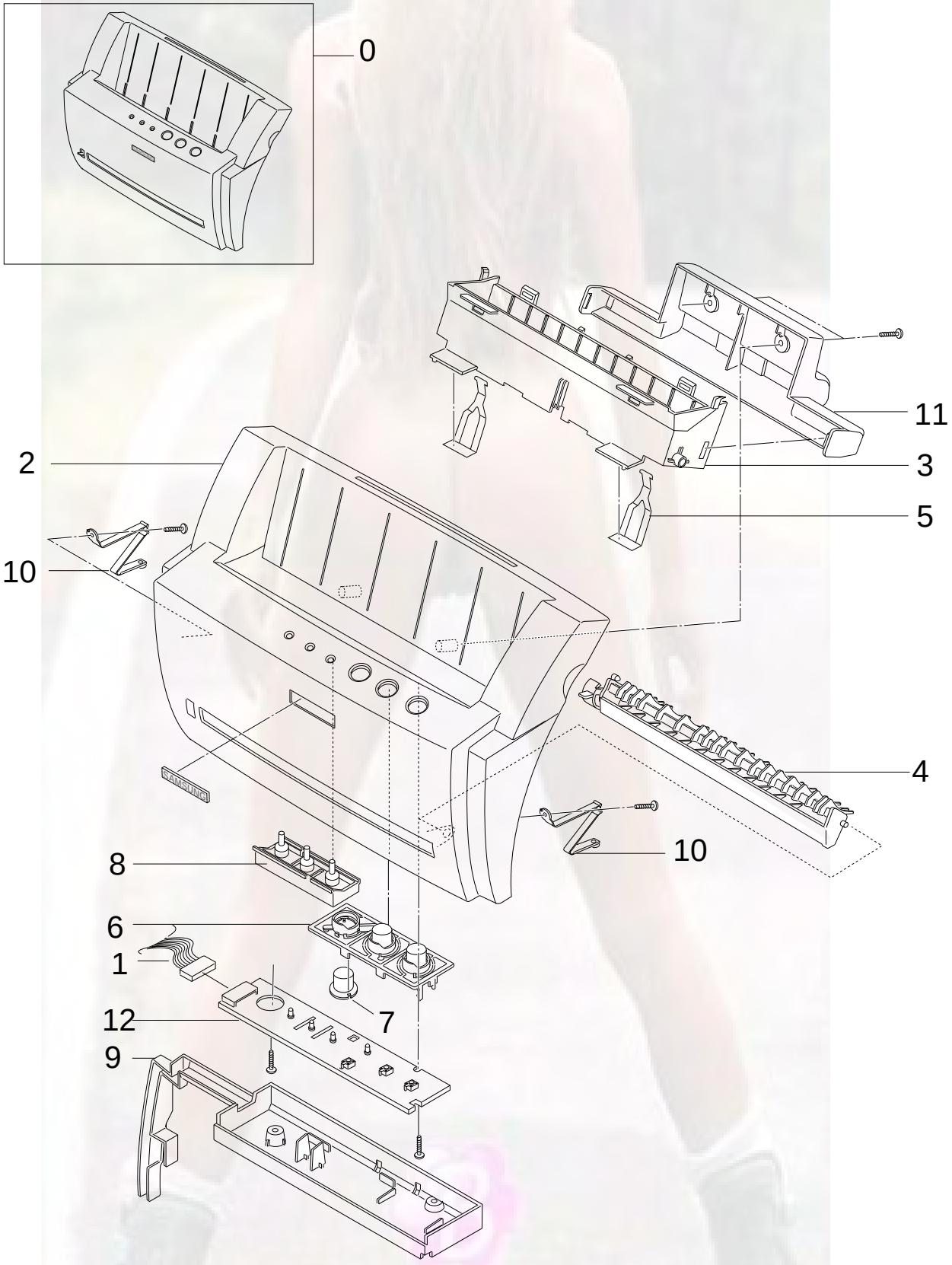
SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
1	ELA-HOU-SHIELD ENGINE	*	1	X	
2 ⚠	SMPS-4500 V1	JC44-00015A	1	O	110V
	SMPS-4500 V2	JC44-00016A	1	O	220V
3	PBA MAIN CTRL-PCL	JC92-01281A	1	O	
4	ELA HOU-RX DRIVE	JC96-01755A	1	O	
5	MEC-TRAY(P)	JC75-00099A	1	O	
5-1	PMO-TRAY_AUTO	*	1	X	
5-2	PMO-ADJUST_AUTO, L	*	1	X	
5-3	PMO-ADJUST_AUTO, R	*	1	X	
5-4	PMO-GEAR_ADJUST RACK	*	4	X	
5-5	PMO-GEAR_PINION	*	2	X	
5-6	PMO-ADJUST MANUAL, L	*	1	X	
5-7	PMO-ADJUST MANUAL, R	*	1	X	
5-8	TRAY MANUAL, PAPER	*	1	X	
5-9	FILM MANUAL	*	1	X	
5-10	TAPTITE-SCREW	*	6	X	
6	MEC-COVER REAR	JC75-00094A	1	O	
6-1	PMO-TRAY_LARGE	*	1	X	
6-2	PMO-COVER REAR	*	1	X	
7	PMO-COVER TOP	JC72-00522A	1	O	
8	PMO-COVER SIDE(L)	JC72-00523A	1	O	
9	PMO-COVER SIDE(R)	JC72-00524A	1	O	
10	ELA HOU-COVER FRONT	JC96-01758C	1	O	
11	UNIT-LSU	JC59-00006A	1	O	
12	MEC-PLATE UPPER	JC75-00111A	1	O	
13	IPR-PLATE_CHANNEL	JC70-00058A	1	O	
14	PBA SUB-MOTOR	JC92-01273A	1	O	
15 ⚠	ELA HOU-FRAME LOWER	JC96-01756A	1	O	110V
	ELA HOU-FRAME LOWER	JC96-01757A	1	O	220V
16	ELA UNIT-DEVE SET	*	1	X	
17	CBF HARNESS-MAIN PANEL	JC39-00112A	1	O	
18	CBF HARNESS-THERMISTOR	JC39-00045A	1	O	
19	CBF HARNESS-MAIN_HVPS	JC39-00109A	1	O	
20	CBF HARNESS-LSU	JC39-00043A	1	O	

Indicate part is for electrical safety components

O: Service available X: Service not available

5-2 Front Exploded View



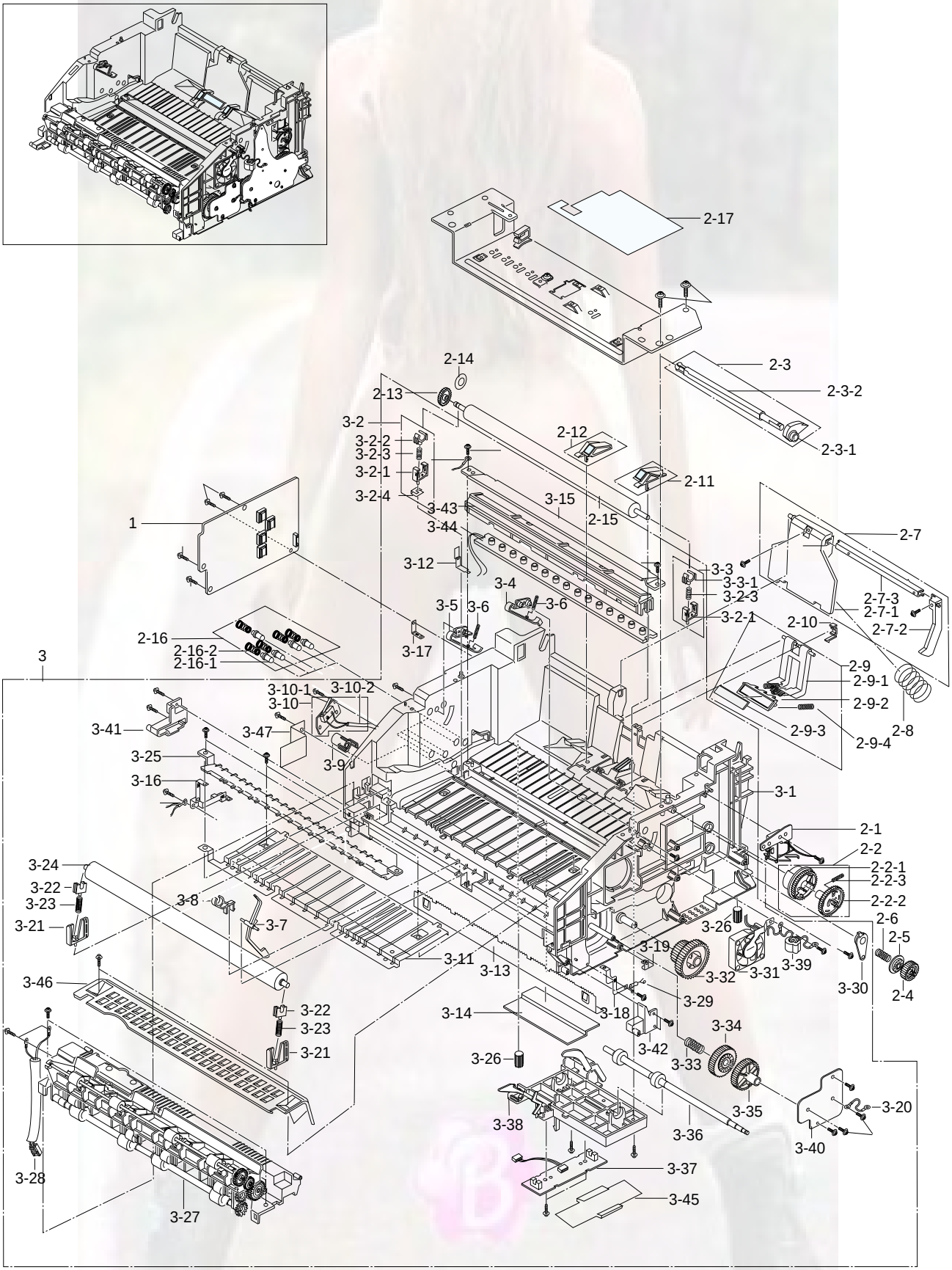
Front Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0	ELA HOU-COVER FRONT	JC96-01758C	1	O	
1	CBF HARNESS-PANEL MAIN	*	1	X	
2	PMO-COVER FRONT	*	1	X	
3	PMO-GUIDE STACKER	*	1	X	
4	PMO-DOOR FACE UP	*	1	X	
5	PPR-SHEET PAPER GUIDE	*	2	X	
6	PMO-KEY A	*	1	X	
7	PMO-KEY B	*	1	X	
8	PMO-LENS SED	*	1	X	
9	PMO-COVER PCB	*	1	X	
10	PMO-STOPPER	*	1	X	
11	PMO-BRKT PUSH DEVE	*	1	X	
12	PBA SUB DISP-PANEL	*	1	X	

O: Service available X: Service not available

5-3 Engine/Frame Lower Exploded View



Engine/Frame Lower Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
1	SMPS-HVPS	JC44-00017A	1	O	
2	ELA HOU-ENGINE ASS'Y	*	1	X	
2-1	SOLENOID-(APOLLO)	JC33-00002A	1	O	
2-2	MEC-GEAR PICKUP	JC75-00056A	1	O	
2-2-1	PMO-GEAR_PICKUP,1	*	1	X	
2-2-2	PMO-GEAR_PICKUP,2	*	1	X	
2-2-3	SPRING-PICKUP,GEAR	*	1	X	
2-3	MEC-CAM PICKUP	JC75-00072A	1	O	
2-3-1	PMO-CAM_PICKUP	*	1	X	
2-3-2	PMO-SHAFT_PICKUP	*	1	X	
2-4	PMO-GEAR_FEED	JC72-00115A	1	O	
2-5	PMO-CLUTCH_FEED	JC72-00116A	1	O	
2-6	SPRING-CLUTCH	JC61-00012A	1	O	
2-7	MEC-KNOCKUP ASS'Y	JC75-00053A	1	O	
2-7-1	PMO-PLATE_KNOCKUP	*	1	X	
2-7-2	PMO-CAM-KNOCKUP	*	1	X	
2-7-3	IPR-BAR_KNOCKUP	*	1	X	
S-6	SCREW-TAPTITE	*	2	X	
2-8	SPRING-KNOCK UP	JC61-00023A	1	O	
2-9	MEC-HOLDER PAD	JC75-00093A	1	O	
2-9-1	PMO-HOLDER_PAD	JC72-00535A	1	O	
2-9-2	PMO-HOLDER_PAD	*	1	X	
2-9-3	RPR-PAD FRICTION	*	1	X	
2-9-4	SPRING-PAD	*	2	X	
2-10	PMO-CAP_PAD	JC72-00124A	2	O	
2-11	MEC-SIDE PAD(R)	JC75-00051B	1	O	
2-12	MEC-SIDE PAD(L)	JC75-00050B	1	O	
2-13	PMO-GEAR_TRANSFER	JC72-00179A	1	O	
2-14	PPR-SPACER DR	*	1	X	
2-15	MEC-TRANSFER ROLLER	JC75-00035A	1	O	
2-16	MEC-TERMINAL	JC75-00049A	5	O	
2-16-1	TERMINAL	*	1	X	
2-16-2	SPRING-HV APOLLO	*	1	X	
2-17	PCT-INSULATOR ENG BD	*	1	X	
S-1	SCREW-TAPTITE	*	9	X	

O: Service available X: Service not available

Engine/Frame Lower Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
3 ⚠	ELA HOU-FRAME LOWER	JC96-01756A	1	O	110V
	ELA HOU-FRAME LOWER	JC96-01757A	1	O	220V
3-1	PMO-FRAME LOWER	*	1	X	
3-2	MEA ETC-HOLDER TR L	*	1	X	
3-2-1	PMO-HOLDER TR	*	1	X	
3-2-2	PMO-BUSHING_TR(L)	*	1	X	
3-2-3	SPRING-TR	*	1	X	
3-2-4	IPR-PLATE_TR	*	1	X	
3-3	MEA ETC-HOLDER TR R	*	1	X	
3-2-1	PMO-HOLDER TR	*	1	X	
3-3-1	PMO-BUSHING_TR(R)	*	1	X	
3-2-3	SPRING-TR	*	1	X	
3-4	PMO-CAP PLTE GU/DEV R	*	1	X	
3-5	PMO-CAP PLTE GU/DEV L	*	1	X	
3-6	SPRING-GUIDE DEVE	*	2	X	
3-7	PMO-ACTUATOR_EXIT	*	1	X	
3-8	PMO-HOLDER_EXIT	*	1	X	
3-9	PMO-BUSHING_TERMINAL	*	1	X	
3-10	ELA HOU-OPEN SENSOR	*	1	X	
3-10-1	IPR-BRKT_SENSOR	*	1	X	
3-10-2	CBF-HARNESS COVER	*	1	X	
S-10	SCREW-TAPTITE	*	1	X	
3-11	IPR-GUIDE-TR	*	1	X	
3-12	IPR-PLATE-TERMINAL	*	1	X	
3-13	IPR-SAW_PLATE	*	1	X	
3-14	PCT-FILM SAW	*	1	X	
3-15	IPR-EARTH_TRANS	*	1	X	
3-16	IPR-GROUND_GUIDE	*	1	X	
3-17	IPR-GROUND_HVPS	*	1	X	
3-18	IPR-GROUND_FUSER	*	1	X	
3-19	IPR-GROUND_DRIVE	*	1	X	
3-20	CBF HARNESS-OPE GND	*	2	X	
3-21	PMO-HOLDER_PR	*	1	X	
3-22	BEARING-PRESSUE R	*	1	X	
3-23	SPRING-PR	*	1	X	

Indicate part is for electrical safety components

O: Service available X: Service not available

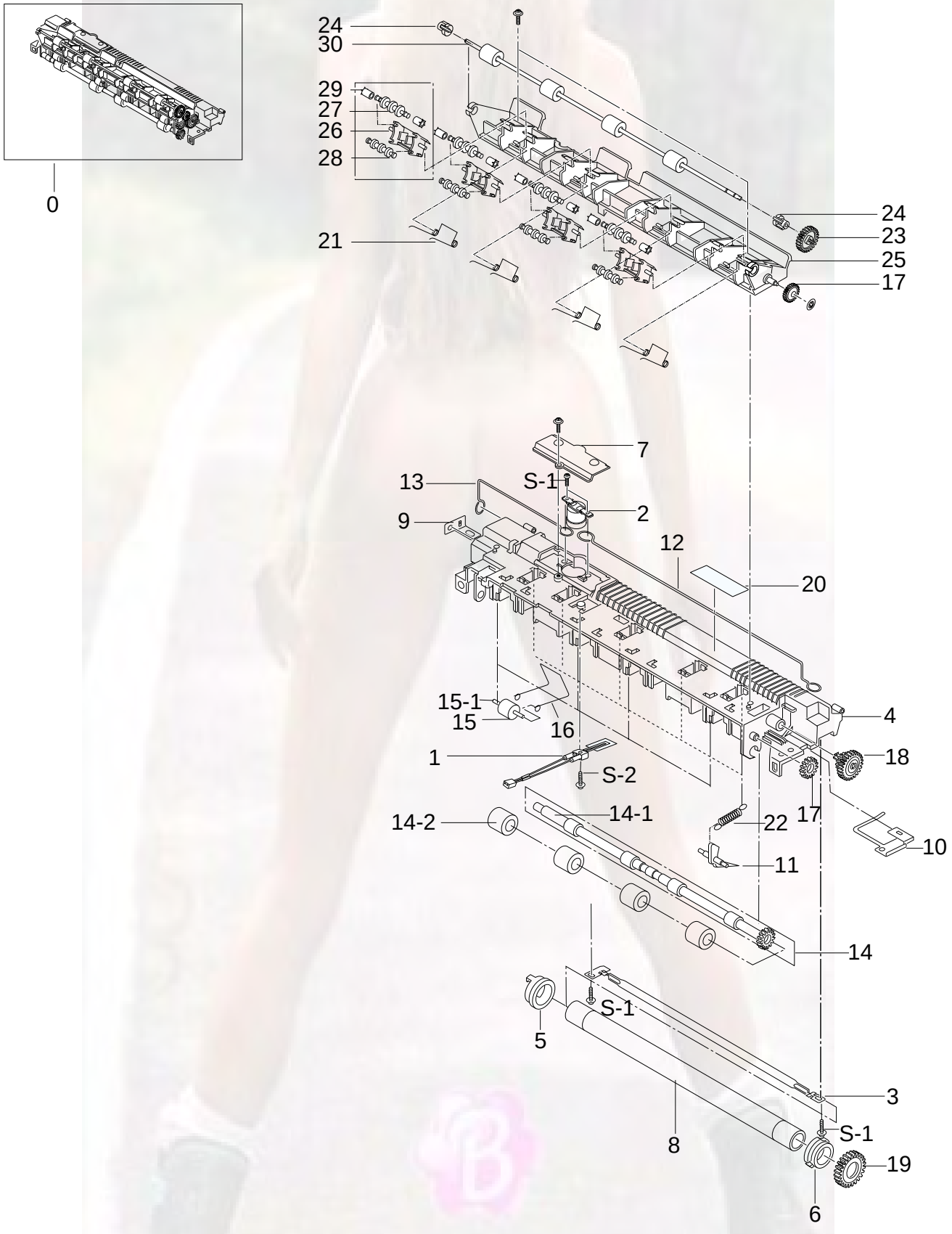
SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
3-24	MEC-ROLLER_PRESSURE	*	1	X	
3-25	PMO-GUIDE_INPUT	*	1	X	
3-26	RMO-RUBBER_FOOT	*	2	X	
3-27 ⚠	ELA HOU-FUSER ASS'Y	JC96-02028B	1	O	110V
	ELA HOU-FUSER ASS'Y	JC96-02028A	1	O	220V
3-28	CBF-HARNESS FUSER	*	1	X	
3-29	ELA HOU-MOTOR GND	*	1	X	
3-30	PMO-BUSHING SHAFT	*	1	X	
3-31	FAN-DC	3103-001085	1	O	
3-32	PMO-GEAR_83/35	*	1	X	
3-33	SPRING-FUSER DR	*	1	X	
3-34	PMO-GEAR_FU_IN 47	*	1	X	
3-35	PMO-GEAR_FU_OUT 47	*	1	X	
3-36	MEC-ROLLER FEED	*	1	X	
3-37	PBA MAIN-SENSOR	*	1	X	
3-38	EMC-HOLDER FEED	*	1	X	
3-39	CBF HARNESS-MOTOR GND	*	1	X	
3-40	IRP-BRKT FUSER DRV	*	1	X	
3-41	PMO-HINGE FRONT(L)	*	1	X	
3-42	PMO-HINGE FRONT(R)	*	1	X	
3-43	PMO-COVER PTL	*	1	X	
3-44	ELA HOU-PTL	*	1	X	
3-45	PCT-INSULATOR SENSOR BD	*	1	X	
3-46	PMO-FRONT FUSER	*	1	X	
3-47	PCT-COVER SHEET LAMP	*	1	X	
S-1	SCREW-TAPTITE	*	10	X	
S-2	SCREW-TAPTITE	*	2	X	

Indicate part is for electrical safety components

O: Service available X: Service not available

5-4 Fuser Exploded View



Fuser Parts Lists

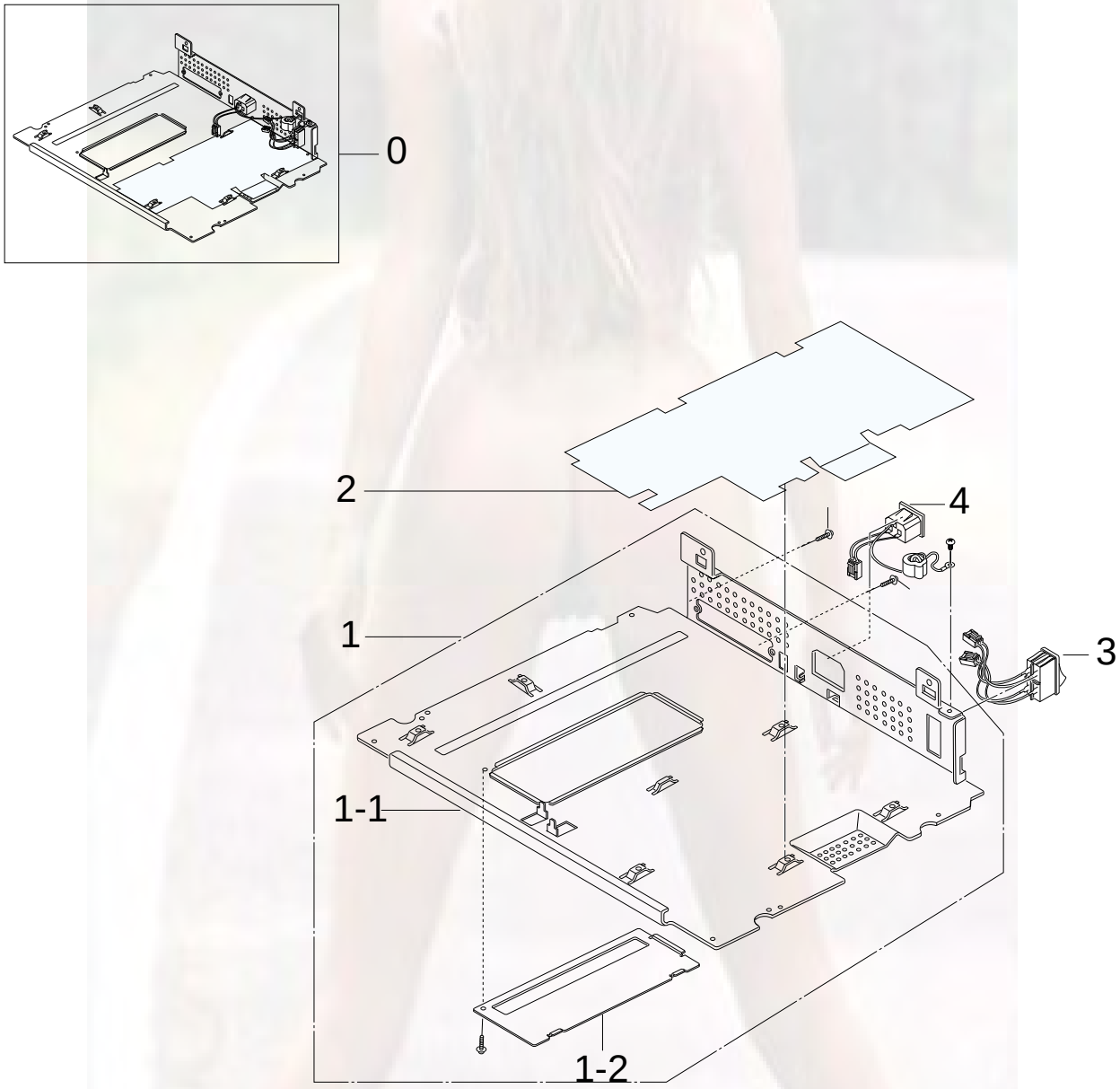
SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0 ⚠	ELA HOU-FUSER ASS'Y	JC96-02028B	1	O	110V
	ELA HOU-FUSER ASS'Y	JC96-02028A	1	O	220V
1	THERMISTOR-NTC	1404-001188	1	O	
2	THERMOSTAT-150C	4712-000001	1	O	
3 ⚠	LAMP-HALOGEN	4713-001120	1	O	110V
	LAMP-HALOGEN	4713-001121	1	O	220V
4	PMO-COVER FUSER	*	1	X	
5	PMO-BUSHING H/R, L	*	1	X	
6	PMO-BUSHING H/R, R	*	1	X	
7	PMO-COVER_THERMOSTAT	*	1	X	
8	NPR-ROLLER HEAT	JC71-00012A	1	O	
9	IPR-ELECTRODE_PLATE	*	1	X	
10	IPR-GROUND_FU	*	1	X	
11	PMO-GUIDE CLAW	*	5	X	
12	ELECTRODE-WIRE,1	*	1	X	
13	ELECTRODE-WIRE,S	*	1	X	
14	MEA ETC-SHAFT EXIT	*	1	X	
14-1	PMO-SHAFT_EXIT(Z15)	*	1	X	
14-2	RMO-RUBBER_EXIT	*	4	X	
15	PMO-ROLLER_IDLE EXIT	*	4	O	
15-1	IPR-PIN ROLLER EXIT	*	4	X	
16	SPRING-EXIT	*	4	X	
17	PMO-GEAR_EXIT_DRV16	*	1	X	
18	PMO-GEAR_EXIT_IDLE	*	1	X	
19	PMO-GEAR_FUSER	*	1	X	
20	LABEL (R)-CAU_HOT_FU	*	1	X	
21	SPRING-EXIT DOWN	*	4	X	
22	SPRING-ES, GUIDE CLAW	*	4	X	
23	GEAR-EXIT F/DOWN	*	5	X	
24	BEARING-EXIT FU L	*	2	X	
25	PMO-COVER FUSER F/DOWN	*	1	X	
26	PMO-HOLDER_EXIT_DOWN	*	4	X	
27	PMO-EXIT_DOWN_L	*	4	X	
28	PMO-EXIT_DOWN_S	*	4	X	
29	RMO-RUBBER-KICKER	*	8	X	
30	MEC-UNIT_EXIT, F_DOWN	*	1	X	
S-1	SCREW TAPTITE	*	5	X	
S-2	SCREW TAPTITE	*	1	X	

Indicate part is for electrical safety components

O: Service available X: Service not available

5-5 Shield Engine Unit Exploded View



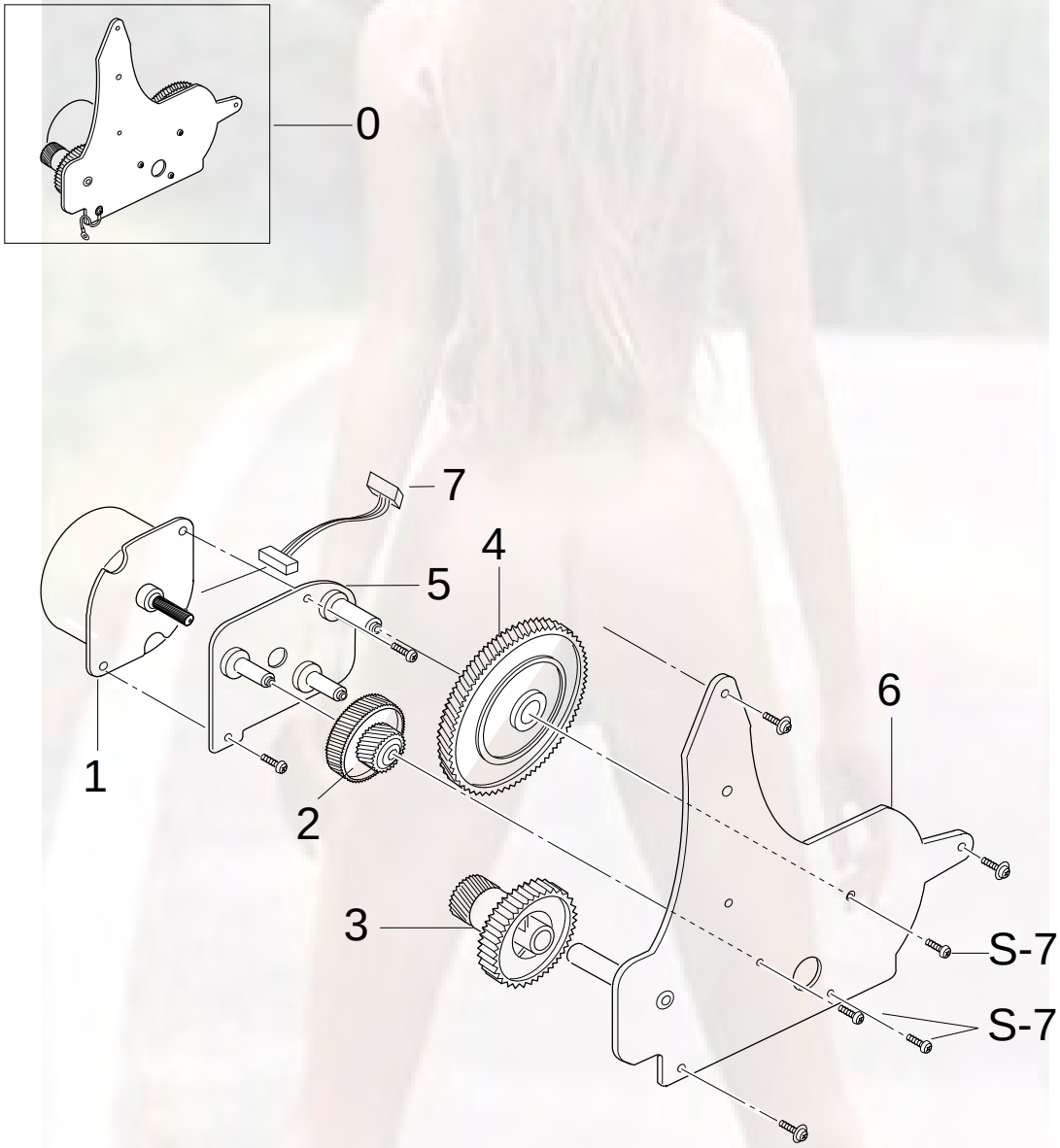
Shield Engine Unit Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0	ELA HOU-SHIELD ENGINE	*	1	X	
1	MEC-SHIELD BRKT CONTROLLER	*	1	X	
1-1	IPR-SHIELD ENGINE	*	1	X	
1-2	IPR-BRKT CONTROLLER	JC70-00131A	1	O	
2	PCT-INSULATOR SMPS	JC72-00555A	1	O	
3	CBF HARNESS-INLET	JC39-00117A	1	O	
4	CBF HARNESS-INLET	JC39-00116A	1	O	
S-1	SCREW-MACHINE	*		X	
S-2	SCREW-TAPTITE	*		X	
S-3	SCREW-TAPTITE	*		X	

O: Service available X: Service not available

5-6 RX Drive Exploded View



RX Drive Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0	ELA HOU-RX DRIVE	JC96-01755A	1	O	
1	MOTOR-STEP	JC31-00005A	1	O	
2	PMO-GEAR_71/28	*	1	X	
-3	PMO-GEAR_73/22	*	1	X	
4	PMO-GEAR_132/19	*	1	X	
5	IPR-BRKT_MOTOR	*	1	X	
6	IPR-BRKT_GEAR	*	1	X	
7	CBF-HARNESS_MOTOR	*	1	X	
S-7	SCREW-MACHINE	*	5	X	

O: Service available X: Service not available

5-7 Plate-Upper Unit Exploded View

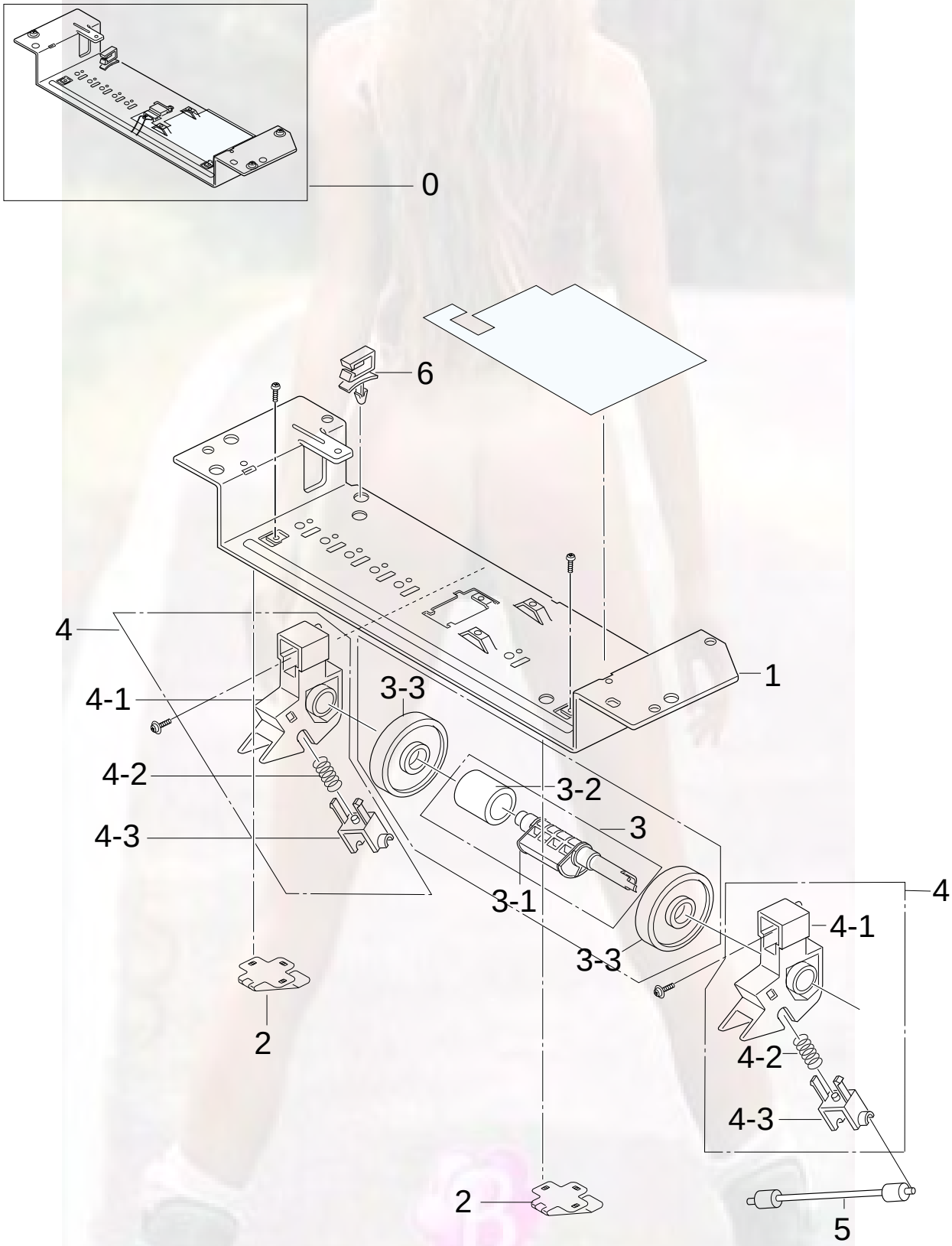


Plate-Upper Unit Parts Lists

SA. : Service Available

Location No.	Description	SEC. Code	Q'ty	SA	Remark
0	MEC-PLATE UPPER	JC75-00111A	1	O	
1	IPR-UPPER-PLATE	*	1	X	
2	IPR-PLATE SPRING DEV	*	2	X	
3	MEA ETC-ROLLER PICKUP	*	1	X	
3-1	PMO-HOUSING_PICKUP	*	1	X	
3-2	RMO-ROLLER_PICKUP	*	1	X	
3-3	PMO-IDLE_PICKUP	*	2	X	
4	MEA ETC-IDLE FEED	*	2	X	
4-1	PMO-HOLDER_PICKUP	*	1	X	
4-2	SPRING-FEED	*	1	X	
4-3	PMO-HOLDER_IDLE,FEED	*	1	X	
5	ICT-ROLLER_IDLE,FEED	*	1	X	
6	CABLE CLAMP	*	1	X	
S-1	SCREW TAPTITE	*	3	X	
S-9	SCREW TAPTITE	*	2	X	

O: Service available X: Service not available

Memo

6. Electrical Parts Lists

6-1 Main PBA

SEC CODE	LOCATION NO.	Q'ty	DESCRIPTION
JC92-01281A		**1**	**PBA MAIN CTRL-PCL**
0202-000108		0	SOLDER-CREAM "RMA-010 T-322,S63,-,-"
0202-000118		0	SOLDER-WIRE "KR-19 RMA,-,D0.8,-,-"
0401-000116	"D4,D5,D6,D7,D8"	5	DIODE-SWITCHING"MMSD914T1,100V,200mA,225mW,4nS"
0404-000112	D1	1	DIODE-SCHOTTKY "RB420D,25V,100mA,SOT-23,TP"
0407-000101	"D2,D3,D9"	3	DIODE-ARRAY "DA204K,20V,100mA,C2-3,SOT-23,T"
0501-000338	"Q1,Q2,Q3"	3	TR-SMALL SIGNAL "2SC2812,NPN,200mW,SOT-23,TP,20"
0801-000388	U37	1	IC-CMOS LOGIC "74HC08,AND GATE,SOP,14P,150MIL"
0801-000477	"U1,U6"	2	IC-CMOS LOGIC "74HCT273,D FLIP-FLOP,SOP,20P,3"
0801-001072	"U35,U36"	2	IC-CMOS LOGIC "74ACT32,OR GATE,SOP,14P,150MIL"
0801-001090	U40	1	IC-CMOS LOGIC "74HC14,SCHIMITT INVERTER,SOP,1"
0801-001262	U7	1	IC-CMOS LOGIC "74HC4060,BINARY COUNTER,DIP,16"
0803-001392	U39	1	IC-TTL "7406,BUFFER/DRIVER,SOP,14P,300"
0803-001393	U38	1	IC-TTL "7407,BUFFER/DRIVER,SOP,14P,150"
0803-003058	U4	1	IC-TTL "74F1071,ESD,SOP,20P,-,-,TP,PLA"
0904-001319	U42	1	IC-USC"USBN9602-28M,8BIT,SOP,28P,300MIL,48MHZ,ST,-,PLASTIC,3.3V,-"
1006-000243	U2	1	IC-LINE TRANSCEIVER "74ACT245,SOP,20P,-,OCTAL,ST,PL"
1103-000133	U10	1	IC-EEPROM "93C66,256x16BIT,SOP,8P,150MIL,"
1105-001213	"U16,U17"	2	IC-DRAM "416C1204,1Mx16BIT,SOJ,42P,400M"
1107-001121	U13	1	IC-FLASH MEMORY "29F800,1Mx8/512Kx16Bit,TSOP,48P, 787MIL,70nS,5V,10%,PLASTIC,0to+70C,100uA,CMOS,ST"
1202-000164	U8	1	IC-VOLTAGE COMP. "393,SOP,8P,150MIL,DUAL,36V,CMO"
1203-000496	U11	1	IC-VOL. SUPERVISORY "7705,SOP,8P,150MIL,PLASTIC,20V"
1203-001026	"U3,U33"	2	IC-POSI.FIXED REG. "33269,DPAK,3P,265MIL,PLASTIC,3.37/3.33V,-,-40TO+150C,800MA,-,ST"
2001-001140	R32	1	R-CARBON(S) "39OHM,5%,1/2W,AA,TP,2.4X6.4MM"
2007-000070	"R47,R97,R98,R128"	4	R-CHIP "0ohm,5%,1/16W,DA,TP,1608"
2007-000071	"R48,R49,R117,R118,"	4	R-CHIP "22ohm,5%,1/16W,DA,TP,1608"
2007-000074	"R141,R142,R143,R144"	4	R-CHIP "100ohm,5%,1/16W,DA,TP,1608"
2007-000074	"R44,R108"	2	R-CHIP "100ohm,5%,1/16W,DA,TP,1608"
2007-000074	"R45,R56,R110,R111,R112,,R121"	6	R-CHIP "100ohm,5%,1/16W,DA,TP,1608"
2007-000077	"R46,R116"	2	R-CHIP "470ohm,5%,1/16W,DA,TP,1608"
2007-000078	"R106,R107,R114,R134"	4	R-CHIP "1Kohm,5%,1/16W,DA,TP,1608"
2007-000078	"R26~R30,R74,R75,R76,R78,R84"	10	R-CHIP "1Kohm,5%,1/16W,DA,TP,1608"
2007-000078	"R85~R90,R103,R104,R105"	9	R-CHIP "1Kohm,5%,1/16W,DA,TP,1608"
2007-000080	R69	1	R-CHIP "2Kohm,5%,1/16W,DA,TP,1608"
2007-000084	R68	1	R-CHIP "4.7Kohm,5%,1/16W,DA,TP,1608"
2007-000086	"R65,R66,R67"	3	R-CHIP "5.6Kohm,5%,1/16W,DA,TP,1608"
2007-000090	R101	1	R-CHIP "10Kohm,5%,1/16W,DA,TP,1608"
2007-000090	"R14,R15,R20~R25,R60"	9	R-CHIP "10Kohm,5%,1/16W,DA,TP,1608"
2007-000090	"R61,R62,R73,R77,R79~R83"	9	R-CHIP "10Kohm,5%,1/16W,DA,TP,1608"
2007-000090	"R72,R126,R135,R136,R137,R138,R139"	7	R-CHIP "10Kohm,5%,1/16W,DA,TP,1608"
2007-000109	R115	1	R-CHIP "1Mohm,5%,1/16W,DA,TP,1608"
2007-000113	"R16,R70,R71,R132,R150,R151,R152"	7	R-CHIP "33ohm,5%,1/16W,DA,TP,1608"
2007-000113	"R2,R3,R4,R5,R6,R11,R12,R13,R36,R37"	10	R-CHIP "33ohm,5%,1/16W,DA,TP,1608"
2007-000113	"R57,R58,R59,R145~R149"	8	R-CHIP "33ohm,5%,1/16W,DA,TP,1608"
2007-000122	R96	1	R-CHIP "1.2Kohm,5%,1/16W,DA,TP,1608"
2007-000123	"R63,R133"	2	R-CHIP "1.5Kohm,5%,1/16W,DA,TP,1608"
2007-000859	R91	1	R-CHIP "4.3KOHM,5%,1/10W,DA,TP,2012"
2007-000965	R43	1	R-CHIP "5.1Kohm,5%,1/16W,DA,TP,1608"
2007-000965	"R7,R33,R34,R35,R38~R42,R100"	10	R-CHIP "5.1Kohm,5%,1/16W,DA,TP,1608"
2007-001134	"R54,R130"	2	R-CHIP "68ohm,5%,1/16W,DA,TP,1608"

Main PBA

SEC CODE	LOCATION NO.	Q'ty	DESCRIPTION
2007-001134	"R8,R9,R10,R17,R18,R19,R50~R53"	10	R-CHIP "68ohm,5%,1/16W,DA,TP,1608"
2011-001094	"RA1~RA10"	10	R-NETWORK "39ohm,5%,63mW,L,CHIP,8P,TP"
2011-001094	"RA11,RA12,RA13,RA14,RA15,RA17"	6	R-NETWORK "39ohm,5%,63mW,L,CHIP,8P,TP"
2203-000189	"C105~C111,C113"	8	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C114~C121"	8	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C12~C124,C129,C130,C131,C133,C134"	8	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C135~C142"	8	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C158,C177~C183"	8	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C193,C194,C200"	3	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C53,C84~C92"	10	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C68~C72,C75,C77,C78,C79,C82"	10	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000189	"C93~C101"	9	"C-CERAMIC,CHIP" "100nF,+80-20%,25V,Y5V,TP,1608,"
2203-000236	"C152,C153,C154,C155,C156,C157"	6	"C-CERAMIC,CHIP" "0.1nF,5%,50V,NP0,TP,1608"
2203-000236	"C80,C81,C103,C146,C148,C149,C150,C151"	8	"C-CERAMIC,CHIP" "0.1nF,5%,50V,NP0,TP,1608"
2203-000257	"C74,C147,C159,C160,C161,C199"	6	"C-CERAMIC,CHIP" "10nF,10%,50V,X7R,TP,1608"
2203-000440	"C11~C15,C18,C19,C20,C21,C22"	10	"C-CERAMIC,CHIP" "1nF,10%,50V,X7R,TP,1608,-"
2203-000440	"C195,C196,C197"	3	"C-CERAMIC,CHIP" "1nF,10%,50V,X7R,TP,1608,-"
2203-000440	"C195,C196,C197,C198"	4	"C-CERAMIC,CHIP" "1nF,10%,50V,X7R,TP,1608,-"
2203-000440	"C23,C24,C29,C30,C31,C32,C39,C40,C46,C47"	10	"C-CERAMIC,CHIP" "1nF,10%,50V,X7R,TP,1608,-"
2203-000440	"C52,C64~C67,C175,C189,C191"	8	"C-CERAMIC,CHIP" "1nF,10%,50V,X7R,TP,1608,-"
2203-000626	"C41,C42,C43,C55,C57~C61"	9	"C-CERAMIC,CHIP" "0.022nF,5%,50V,NP0,TP,1608"
2203-000626	"C62,C63,C73,C104"	4	"C-CERAMIC,CHIP" "0.022nF,5%,50V,NP0,TP,1608"
2203-000815	"C1,C2,C4~C10,C16"	10	"C-CERAMIC,CHIP" "0.033nF,5%,50V,NP0,TP,1608"
2203-000815	"C17,C164,C165,C166,C170,C171,C172"	7	"C-CERAMIC,CHIP" "0.033nF,5%,50V,NP0,TP,1608"
2203-000998	"C45,C188"	1	"C-CERAMIC,CHIP" "0.047nF,5%,50V,NP0,TP,1608"
2203-001607	"C25,C26,C33,C34,C35,C36,C37,C38,"	8	"C-CERAMIC,CHIP" "0.22nF,5%,50V,NP0,TP,1608"
2203-001656	"C27,C28,C48,C49,C50,C51"	6	"C-CERAMIC,CHIP" "0.47nF,5%,50V,NP0,TP,1608"
2203-005105	C3	1	"C-CERAMIC,CHIP" "0.68nF,5%,50V,NP0,TP,1608"
2401-000042	C167	1	C-AL "100uF,20%,16V,GP,TP,6.3x7,5"
2402-000135	"C162,C163,C168,C169,C190"	5	"C-AL,SMD" "22uF,20%,16V,GP,TP,5.3x5.3x5.4"
2402-000168	C173	1	"C-AL,SMD" "100uF,20%,16V,GP,TP,8.3x8.3x6.3mm"
2402-000176	C54	1	"C-AL,SMD" "10uF,20%,16V,GP,TP,4.3x4.3x5.4"
2404-000468	C174	1	"C-TA,CHIP" "33uF,20%,16V,GP,TP,7343,-"
2801-003943	OSC2	1	CRYSTAL-UNIT"4.446208MHz,50ppm,28-AAM,20pF,120ohm,BK"
2804-001163	OSC1	1	OSCILLATOR-CLOCK "20MHz,50ppm,10TTL & CMOS,ST,5V"
2804-001278	OSC3	1	OSCILLATOR-CLOCK"48MHZ,100PPM,10 TTL & CMOS,ST,5V,40MA"
2804-001374	OSC4	1	OSCILLATOR-CLOCK "28.74448MHz,100ppm,10TTL&CMOS(30pF),ST,5V,30mA"
2901-001178	"F1,F2,F3,F4,F5,F6,F7,F9,F13"	9	FILTER-EMI SMD "25V,2A,-,100000pF,2x1.25x1mm,TP"
3301-000317	"B1,B2,B3,B4,B6,B10,B15,B16"	8	CORE-FERRITE BEAD "AB,2x1.25x0.9mm,-,-"
3702-000118	CN13	1	CONNECTOR-RIBBON "36P,FEMALE,ANGLE,AU"
3709-000177	CN1	1	CONNECTOR-CARD EDGE"72P,1.27mm,ANGLE,SN"
3711-000428	CN3	1	CONNECTOR-HEADER "3WALL,15P,1R,2mm,STRAIGHT,SN"
3711-000470	"CN6,CN9,CN10"	3	CONNECTOR-HEADER "3WALL,4P,1R,2mm,STRAIGHT,SN"
3711-000524	CN2	1	CONNECTOR-HEADER "3WALL,9P,1R,2mm,STRAIGHT,SN"
3711-002410	CN5	1	CONNECTOR-HEADER "BOX,10P,2R,2mm,STRAIGHT,SN"
3711-003408	CN4	1	CONNECTOR-HEADER "BOX,2P,1R,2mm,STRAIGHT,SN"
3711-003968	CN8	1	CONNECTOR-HEADER "BOX,3P,1R,2.5mm,STRAIGHT,SN"
3711-003969	CN11	1	CONNECTOR-HEADER "BOX,2P,1R,2.5mm,STRAIGHT,SN"
3711-003981	CN12	1	CONNECTOR-HEADER "BOX,28P,2R,2mm,STRAIGHT,SN"
3722-001101	CN7	1	JACK-USB "4P/2C,8.38mm,AU,IVR,#22-28"
JC13-00006A	U34	1	IC ASIC- SPGPE+"ML-6060,KS32C61200,QFP,240P,36.4x4"
JC13-00007A	U15	1	IC ASIC-MASK ROM"K3P4C1D-TC(MASK),ML-4500,44P, 5.0V,0to +70C,44-TSOP2-400,TRAY,80mA,CERAMIC,-"
JC41-00079A		1	PCB-PCL "ML-4600,FR-4,4L,-,1.6T,226.0*102.5,-"

6-2 Motor PBA

SEC CODE	LOCATION NO.	Q'ty	DESCRIPTION	
JC92-01273A			**PBA SUB-MOTOR**	
0402-000129	D3	1	DIODE-RECTIFIER	"1N4003,200V,1A,DO-41,TP"
0402-000129	D4	1	DIODE-RECTIFIER	"1N4003,200V,1A,DO-41,TP"
0501-000010	Q3	1	TR-SMALL SIGNAL	"KSC1008,NPN,800mW,TO-92,TP,120"
0501-000010	Q4	1	TR-SMALL SIGNAL	"KSC1008,NPN,800mW,TO-92,TP,120"
1003-001102	U1	1	IC-MOTOR DRIVER	"TEA3718DP,DIP,16P,300MIL,SINGL"
1003-001102	U2	1	IC-MOTOR DRIVER	"TEA3718DP,DIP,16P,300MIL,SINGL"
2001-000290	R23	1	R-CARBON	"10KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000429	R26	1	R-CARBON	"1KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000429	R27	1	R-CARBON	"1KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000449	R20	1	R-CARBON	"2.2KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000812	R5	1	R-CARBON	"5.6KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000812	R6	1	R-CARBON	"5.6KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000832	R21	1	R-CARBON	"510OHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000864	R17	1	R-CARBON	"56KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000864	R18	1	R-CARBON	"56KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000995	R28	1	R-CARBON	"820OHM,5%,1/8W,AA,TP,1.8X3.2MM"
2005-001114	"R24,R25"	2	"R-WIRE WOUND,NON"	"0.44ohm,5%,2W,AA,TP,3.8x11mm"
2201-000391	C13	1	"C-CERAMIC,DISC"	"0.022nF,5%,50V,SL,TP,5x3,5"
2201-000391	C14	1	"C-CERAMIC,DISC"	"0.022nF,5%,50V,SL,TP,5x3,5"
2201-001057	C10	1	"C-CERAMIC,DISC"	"820pF,10%,50V,Y5P,TP,5x3,3"
2201-001057	C11	1	"C-CERAMIC,DISC"	"820pF,10%,50V,Y5P,TP,5x3,3"
2201-001057	C12	1	"C-CERAMIC,DISC"	"820pF,10%,50V,Y5P,TP,5x3,3"
2201-001057	C9	1	"C-CERAMIC,DISC"	"820pF,10%,50V,Y5P,TP,5x3,3"
2401-002300	C1	1	C-AL	"47uF,20%,50V,GP,TP,6.3x11,5"
3711-000470	CN6	1	CONNECTOR-HEADER	"3WALL,4P,1R,2mm,STRAIGHT,SN"
3711-003346	CN7	1	CONNECTOR-HEADER	"BOX,18P,2R,2mm,ANGLE,SN"
3711-003408	CN2	1	CONNECTOR-HEADER	"BOX,2P,1R,2mm,STRAIGHT,SN"
3711-003968	CN5	1	CONNECTOR-HEADER	"BOX,3P,1R,2.5mm,STRAIGHT,SN"
JC39-40511A	J1	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J10	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J11	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J15	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J16	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J17	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J3	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J4	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J5	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J6	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J7	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J8	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC39-40511A	J9	1	CBF HARNESS-	"ML-80,JUMPER,AWG22,52mm,SILVER"
JC41-00076A		1	PCB-ENGINE	"ML-4500,FR-1,1L,-,1.6T,9.8x6.2mm,-,-,-,-"
JC62-00002A		2	HEAT SINK-(4500)	"ML-4500,BRONZE,0.5,9.3,38,-,-,-"

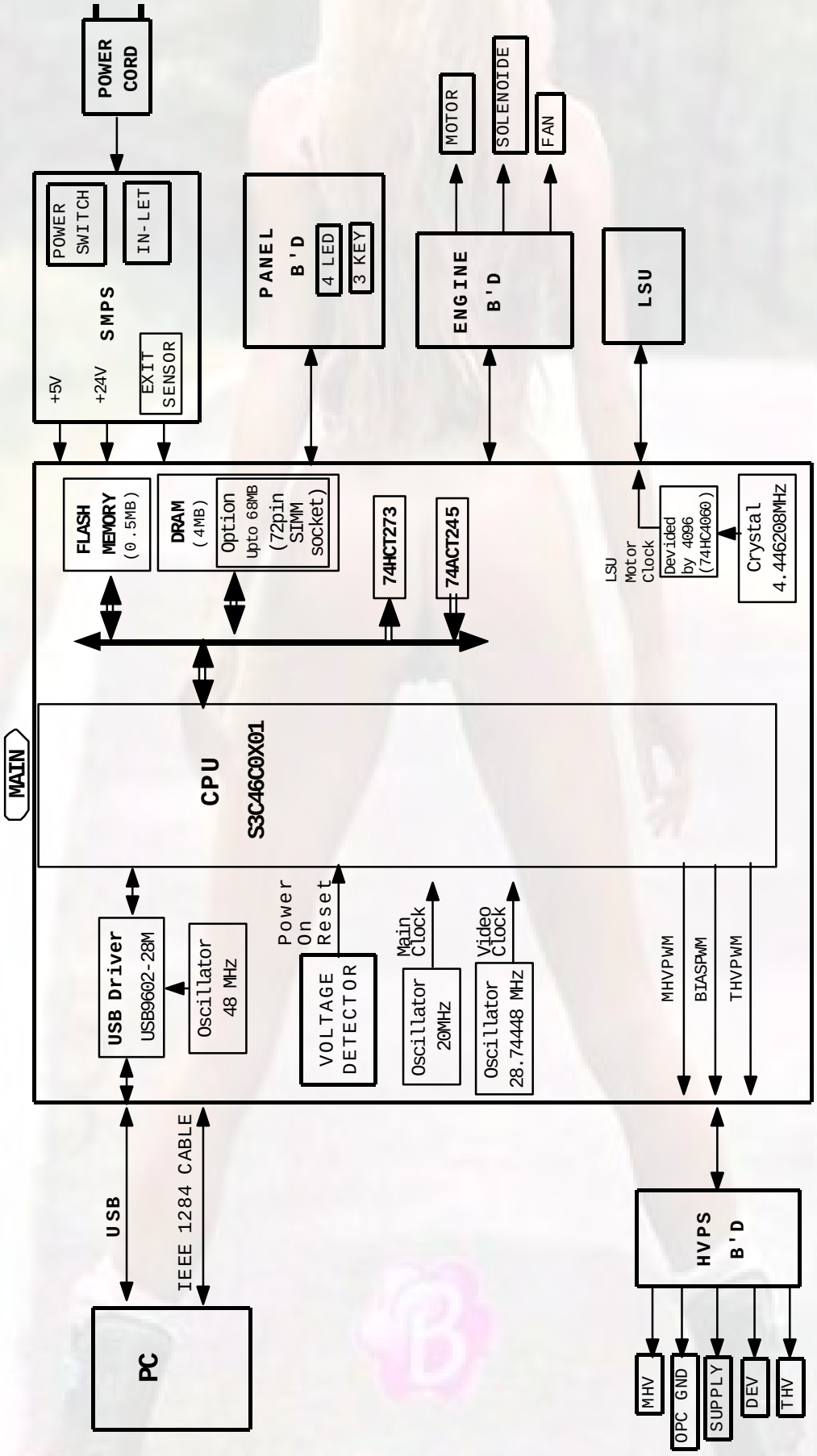
6-3 SENSOR PBA

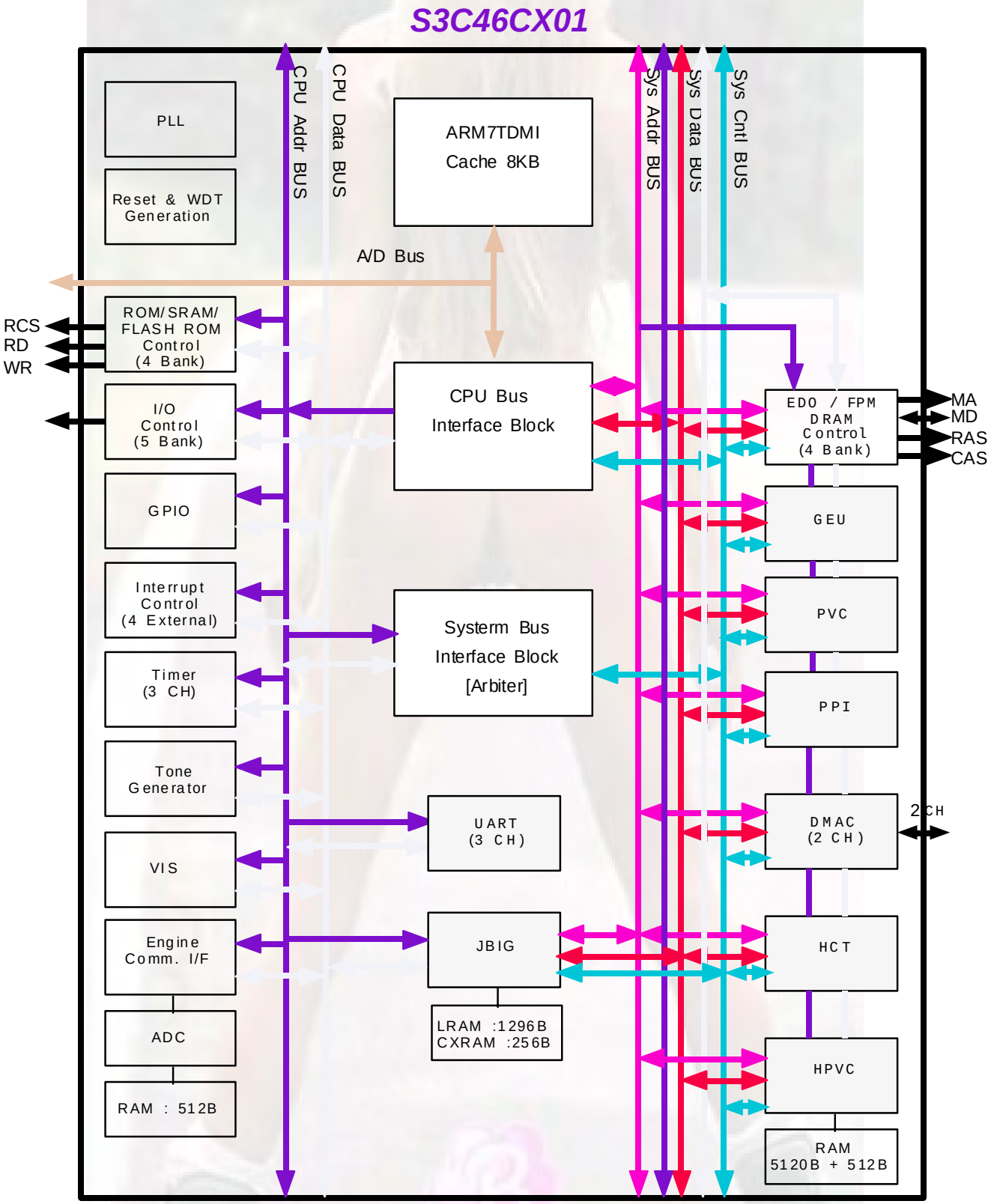
SEC CODE	LOCATION NO.	Q'ty	DESCRIPTION
			PBA MAIN-SENSOR
0604-001155	U1	1	PHOTO-INTERRUPTER "TR,-,175MW,DIP,ST"
0604-001155	U2	1	PHOTO-INTERRUPTER "TR,-,175MW,DIP,ST"
2001-000008	R1	1	R-CARBON "15KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000008	R2	1	R-CARBON "15KOHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000362	R3	1	R-CARBON "150OHM,5%,1/8W,AA,TP,1.8X3.2MM"
2001-000362	R4	1	R-CARBON "150OHM,5%,1/8W,AA,TP,1.8X3.2MM"
JC39-00039A	CN1	1	CBF HARNESS-MAIN/SENSOR "SF-5100,#26,UL 1061,150mm,RED+BLUE,-"
JC41-00033A	SF-5100/XEU	1	PCB-SENSOR "SF-5100,FR-1,1L,1.6,82*20"

6-4 PANEL PBA

SEC CODE	LOCATION NO.	Q'ty	DESCRIPTION
			PBA SUB DISP-PANEL
0601-001254	LED2	1	LED "ROUND,YEL,3mm,585nm"
0601-001255	"LED3,LED6"	2	LED "ROUND,GRN,3mm,570nm"
0601-001261	LED1	1	LED "ROUND,RED,3mm,630nm"
2001-000323	"R1,R2,R3,R4"	4	R-CARBON "120OHM,5%,1/4W,AA,TP,2.4X6.4MM"
2202-000109	C1	1	"C-CERAMIC,MLC-AXIAL" "100NF,+80-20%,50V,Y5V,TP,1.9X3.5MM,-"
3404-000116	"SW1,SW2,SW3"	3	SWITCH-TACT "12V,50mA,160gf,6X6X3.6mm,SPST"
3711-004637	CN1	1	CONNECTOR-HEADER "BOX,9P,1R,2mm,ANGLE,SN"
JC41-00073A		1	PCB-DISPLAY "ML-4500,FR-1,1L,1.6T,166.5x29mm"

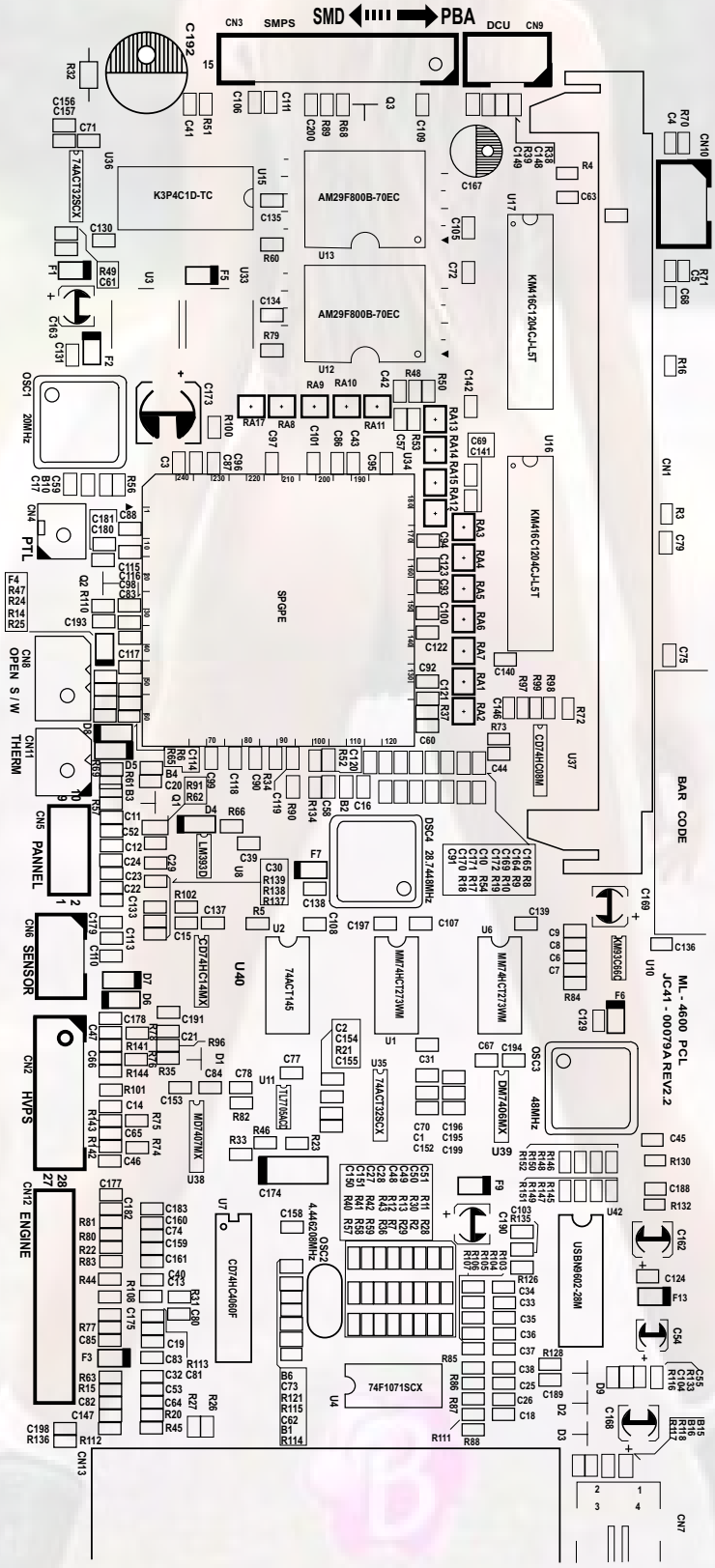
7. Block diagram



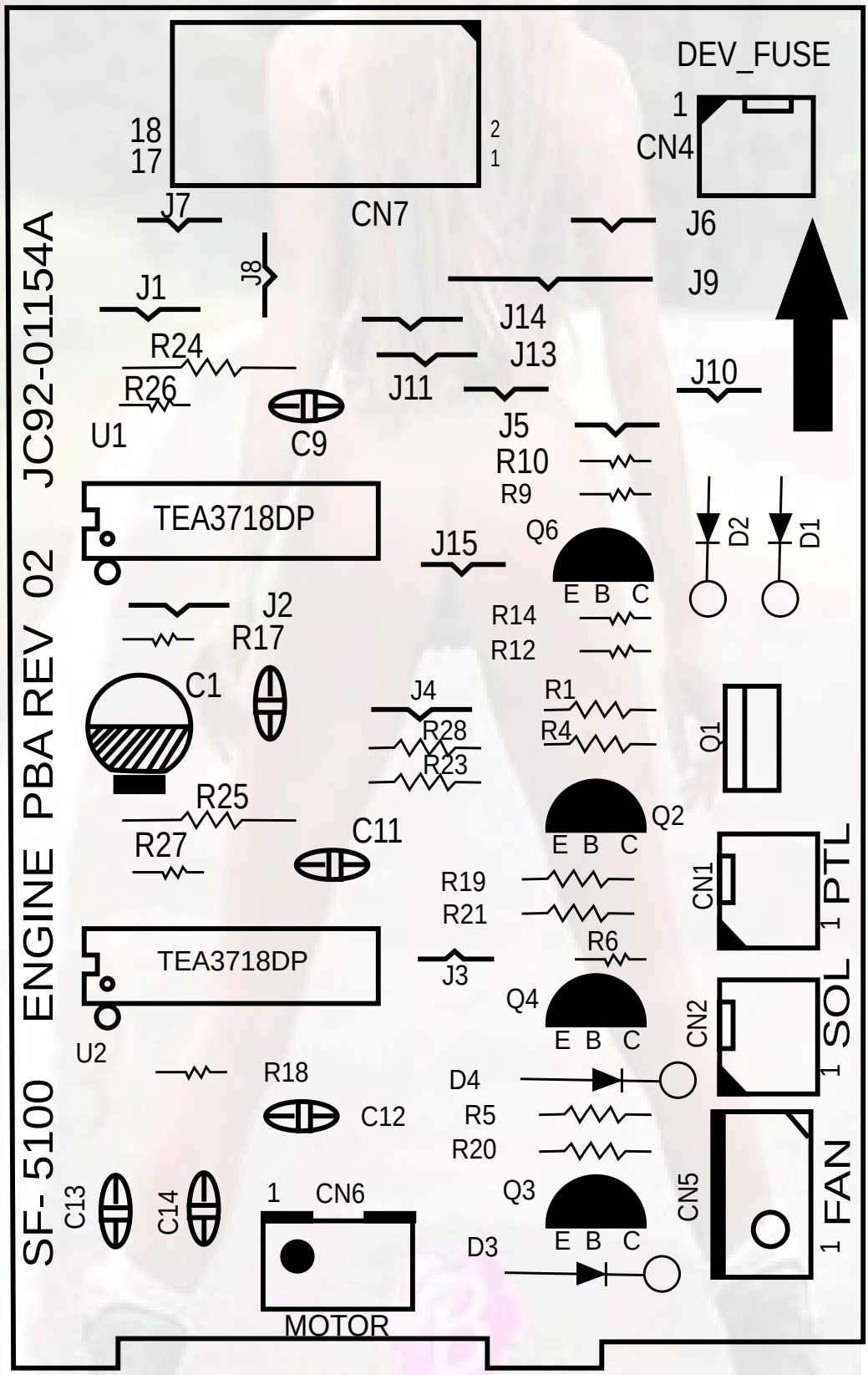

S3C46CX01
CPU Addr BUS
CPU Data BUS
Sys Addr BUS
Sys Data BUS
Sys Cntl BUS
PLL
Reset & WDT Generation
ARM7TDMI Cache 8KB
A/D Bus
RCS
RD
WR
ROM/SRAM/ FLASH ROM Control (4 Bank)
I/O Control (5 Bank)
GPIO
Interrupt Control (4 External)
Timer (3 CH)
Tone Generator
VIS
Engine Comm. I/F
ADC
RAM : 512B
CPU Bus Interface Block
Systerm Bus Interface Block [Arbiter]
UART (3 CH)
JBIG
LRAM :1296B
CXRAM :256B
EDO / FPM DRAM Control (4 Bank)
MA
MD
RAS
CAS
GEU
PVC
PPI
DMAC (2 CH)
2CH
HCT
HPVC
RAM 5120B + 512B

9. PCB Diagrams

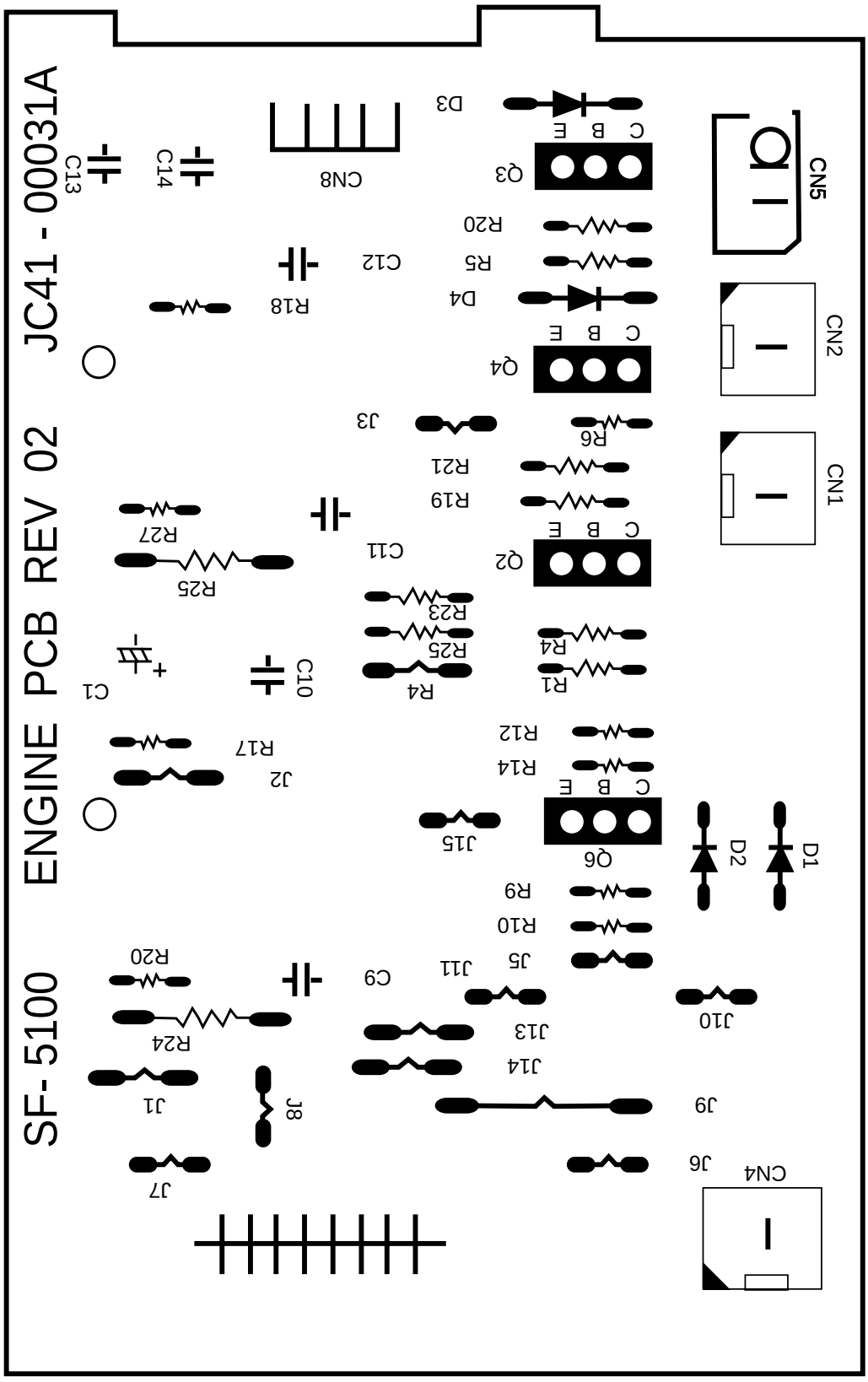
9-1 Main PCB Diagram (Top)



9-2 Engine PCB Diagram (TOP)

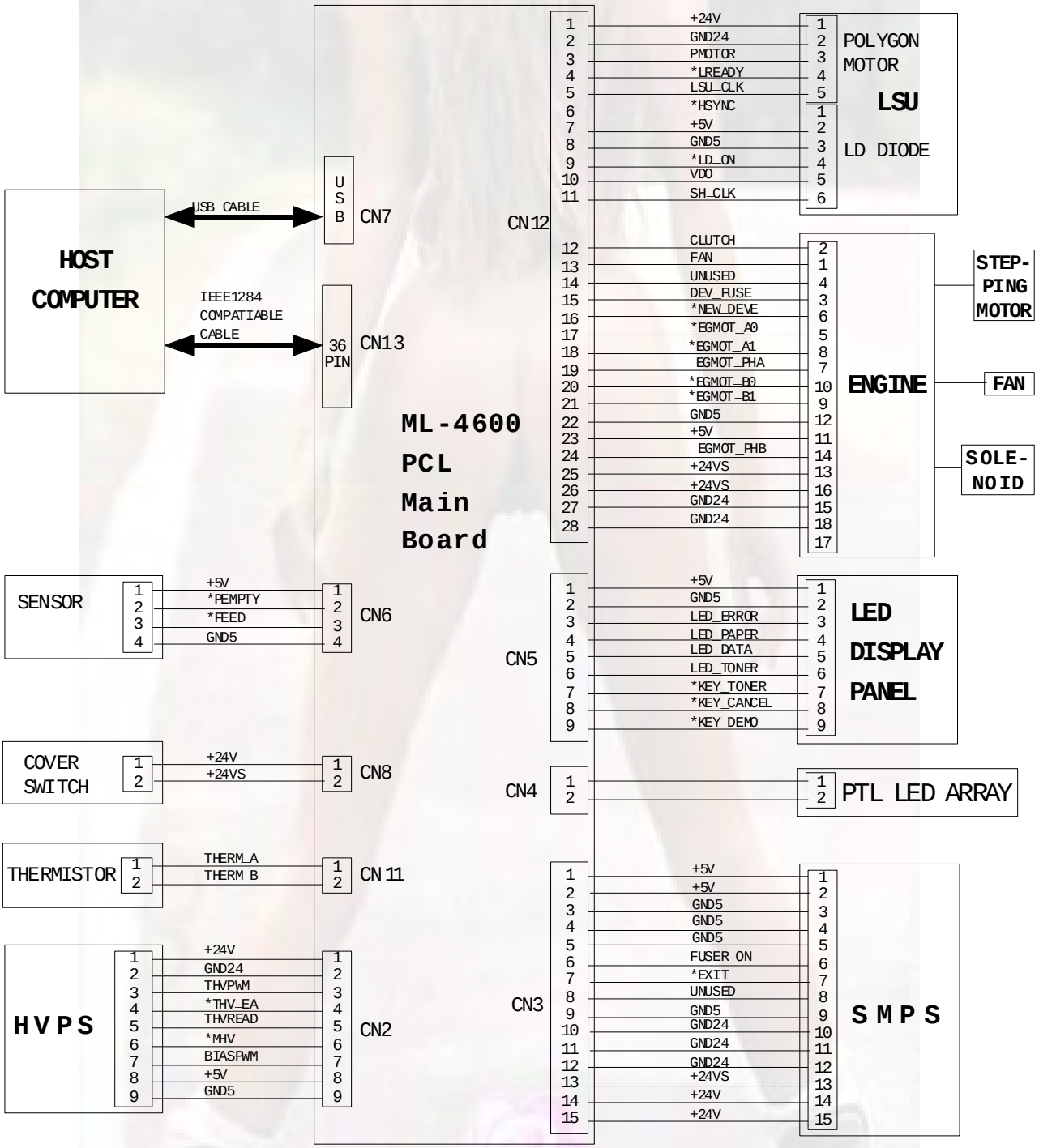


9-3 Engine PCB Diagram (Bottom)



MEMO

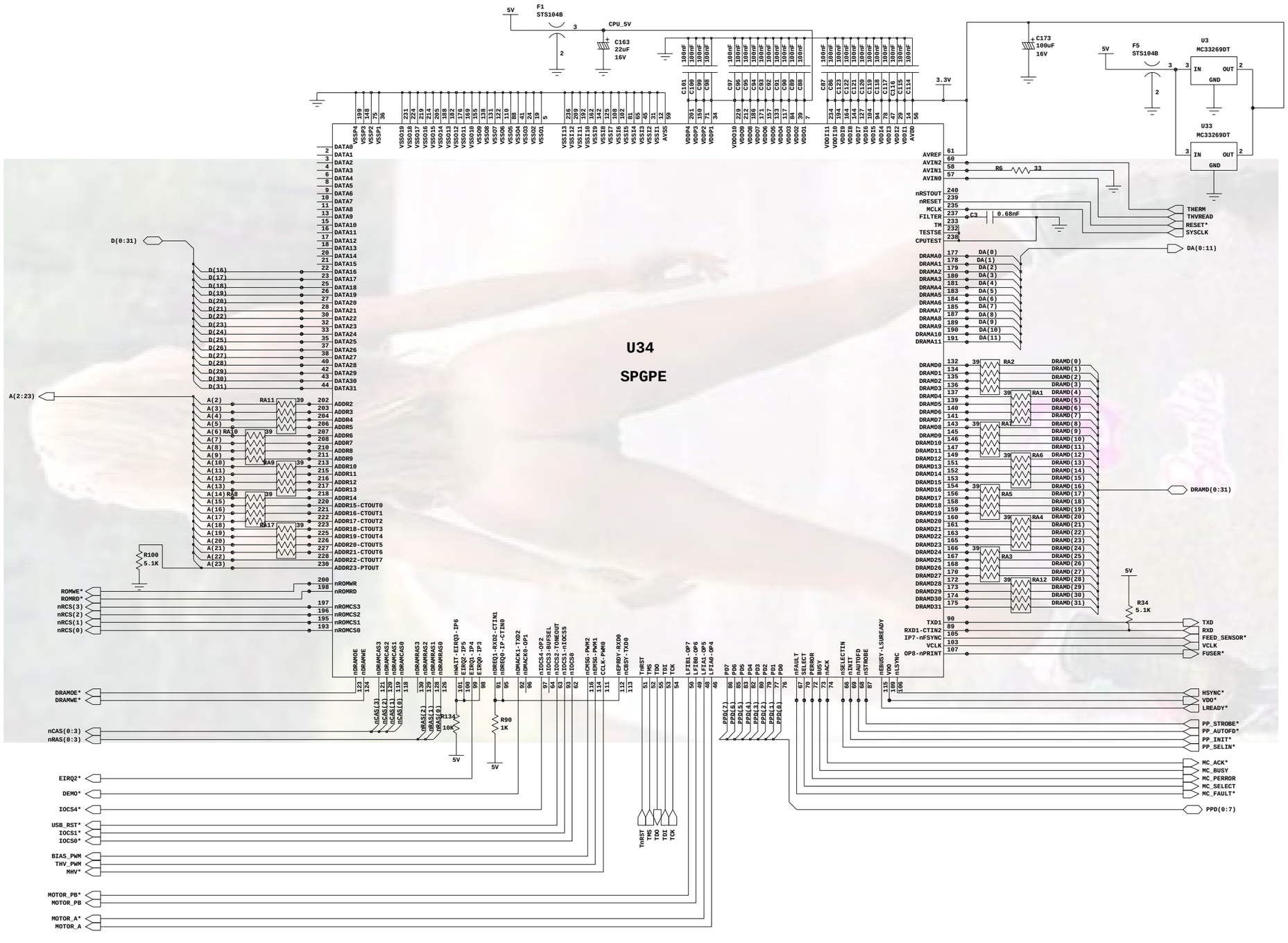
8. Connection diagram



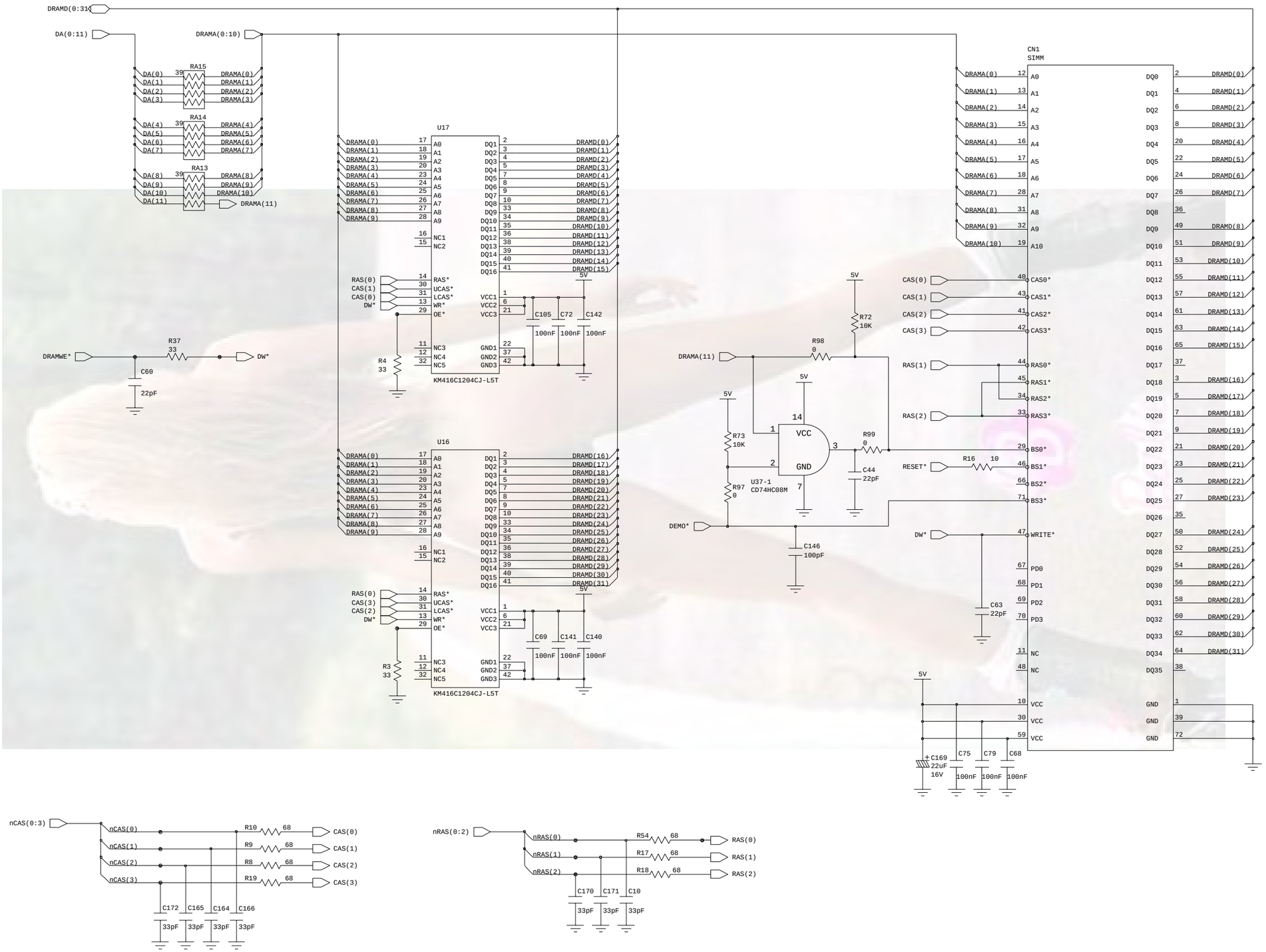
Memo

10. Schematic Diagrams

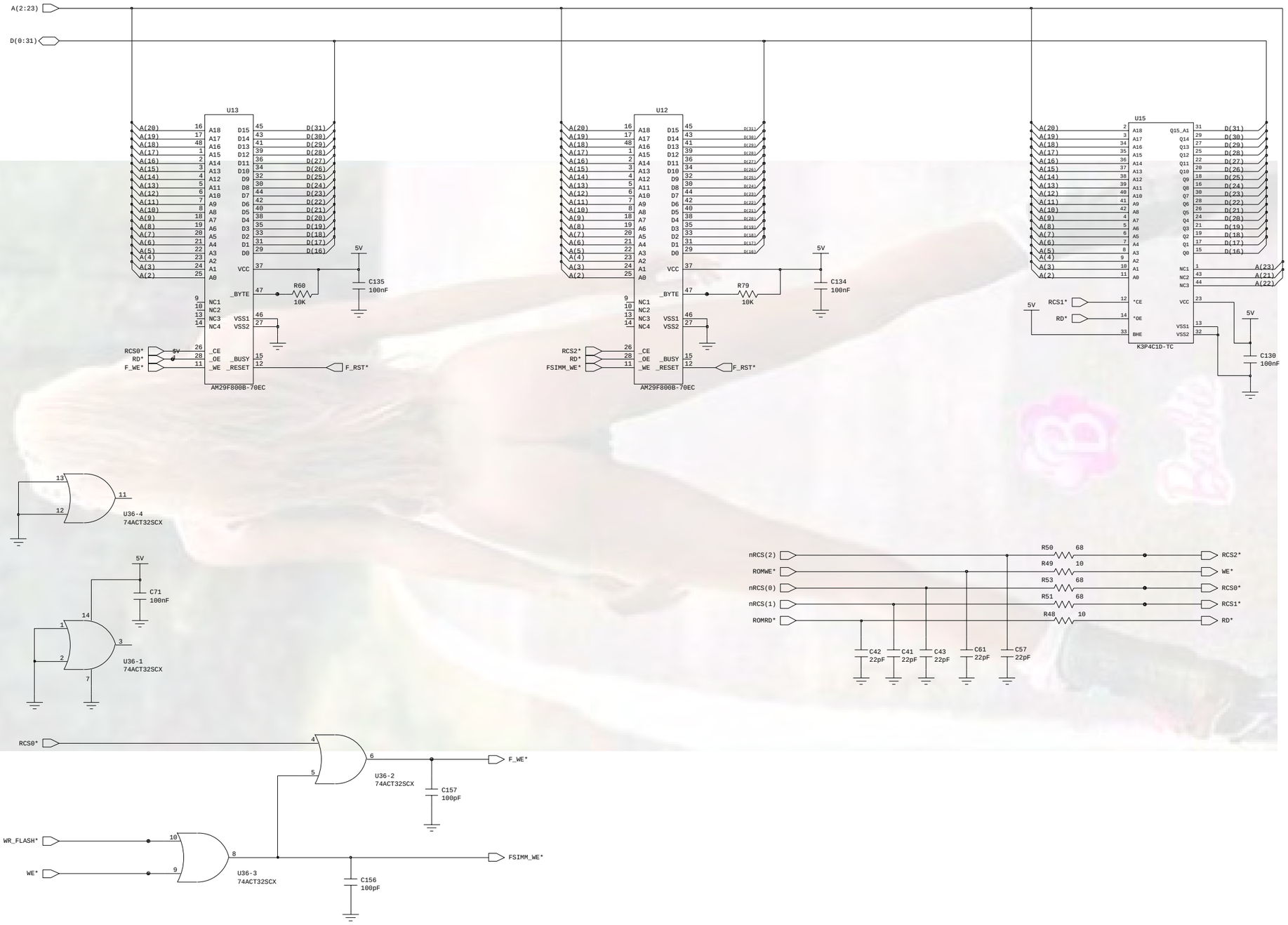
10-1 Main Circuit Diagram(1/9)



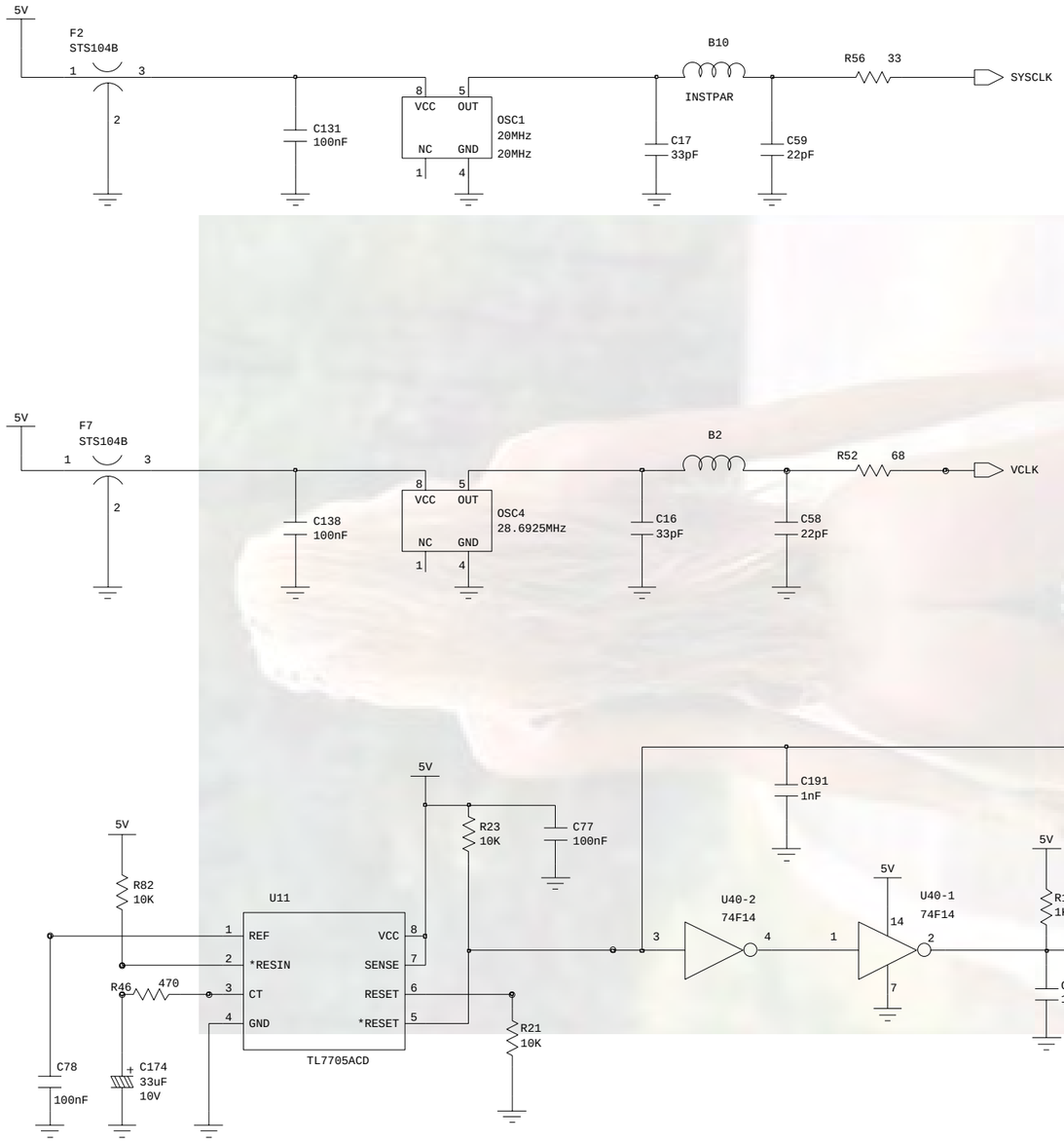
Main Circuit Diagram(2/9)



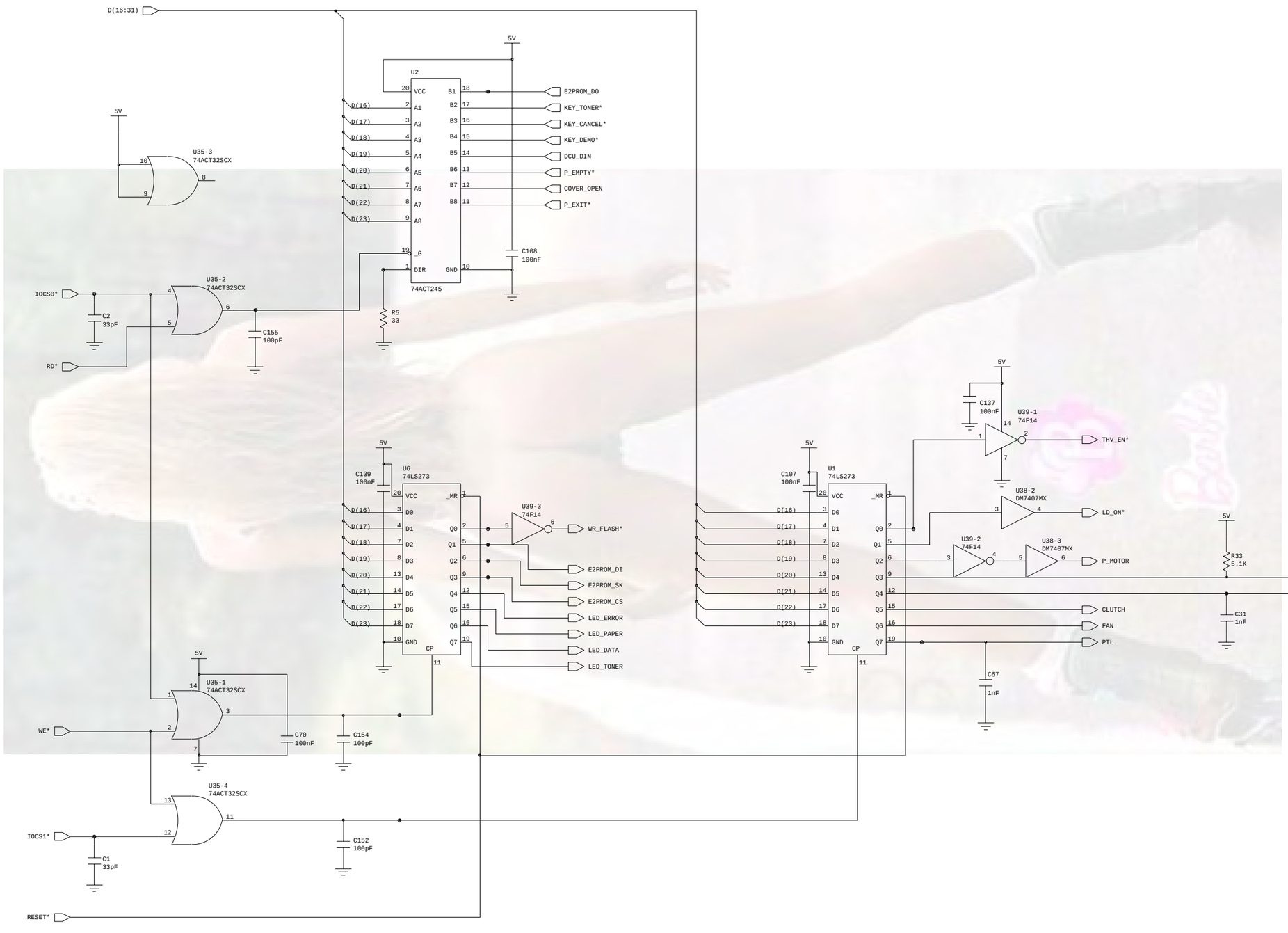
Main Circuit Diagram(3/9)



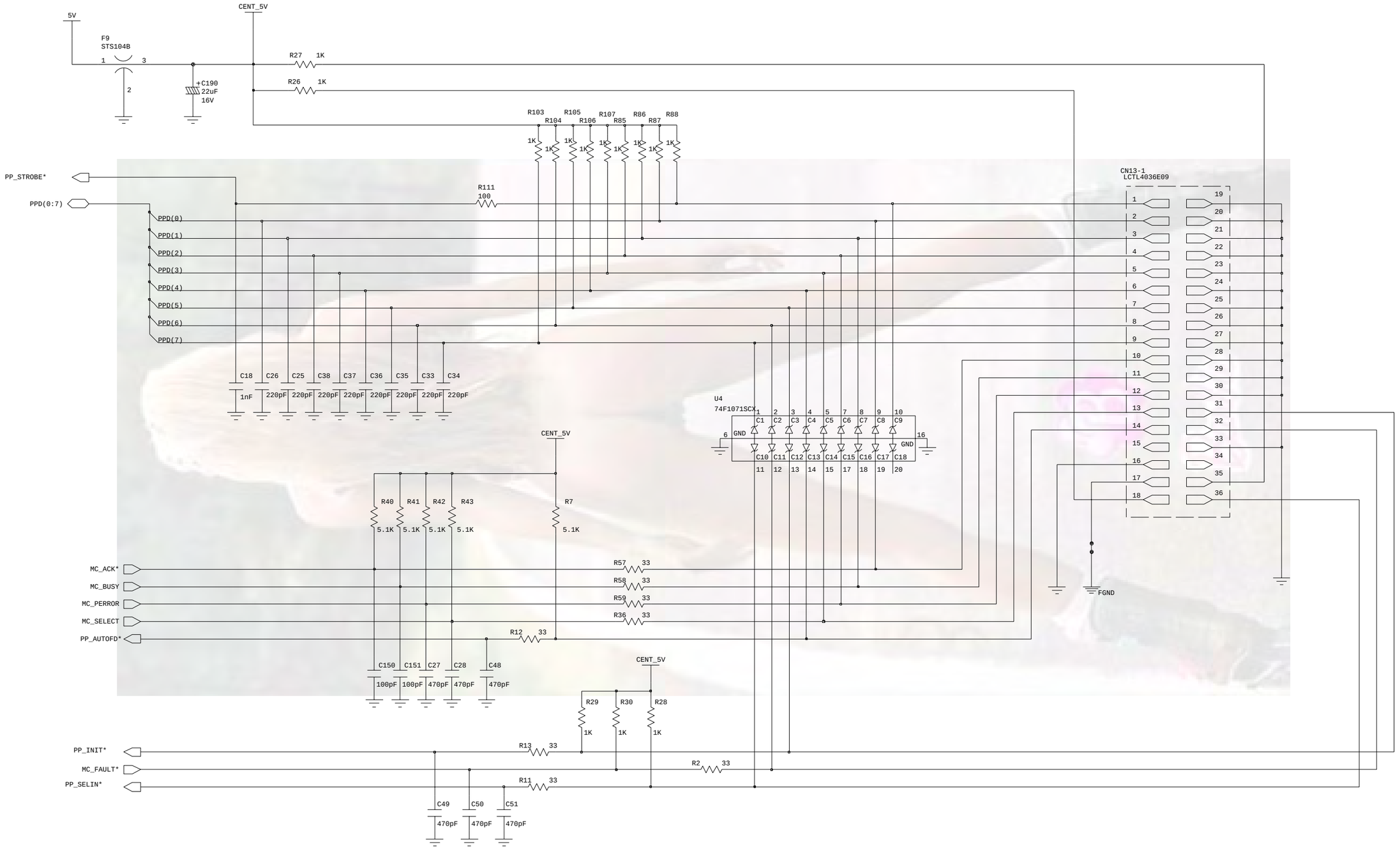
Main Circuit Diagram(4/9)



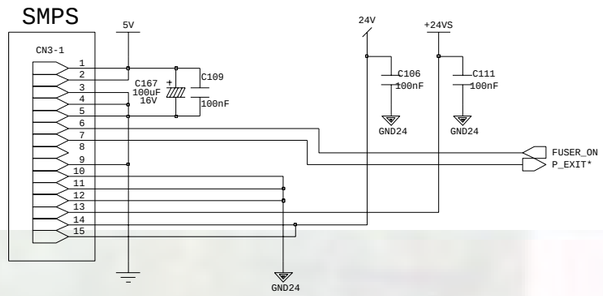
Main Circuit Diagram(5/9)

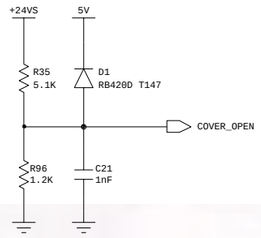


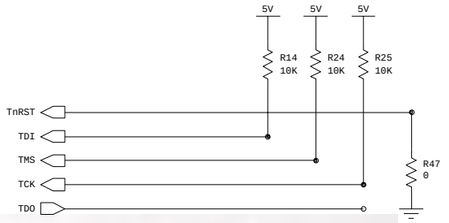
Main Circuit Diagram(6/9)

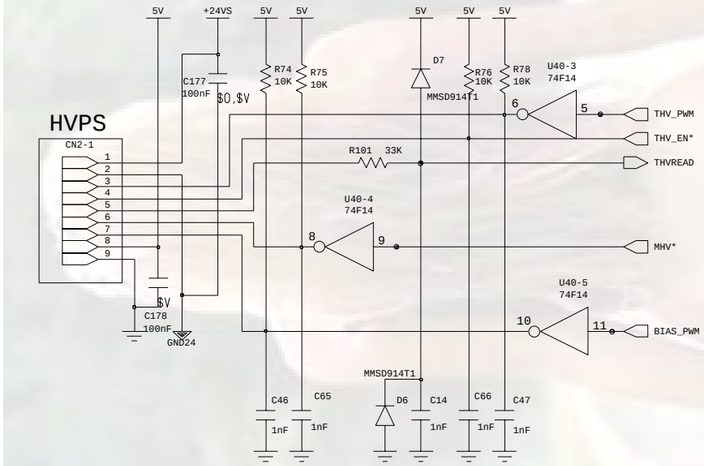


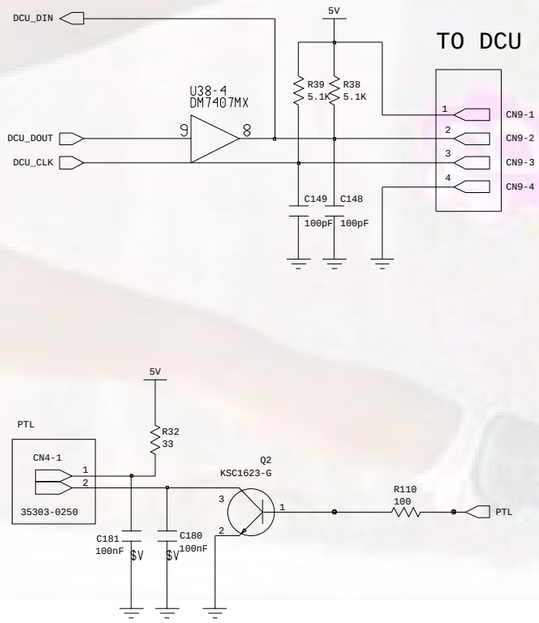
Main Circuit Diagram(7/9)



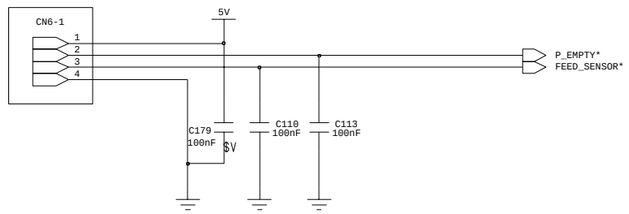




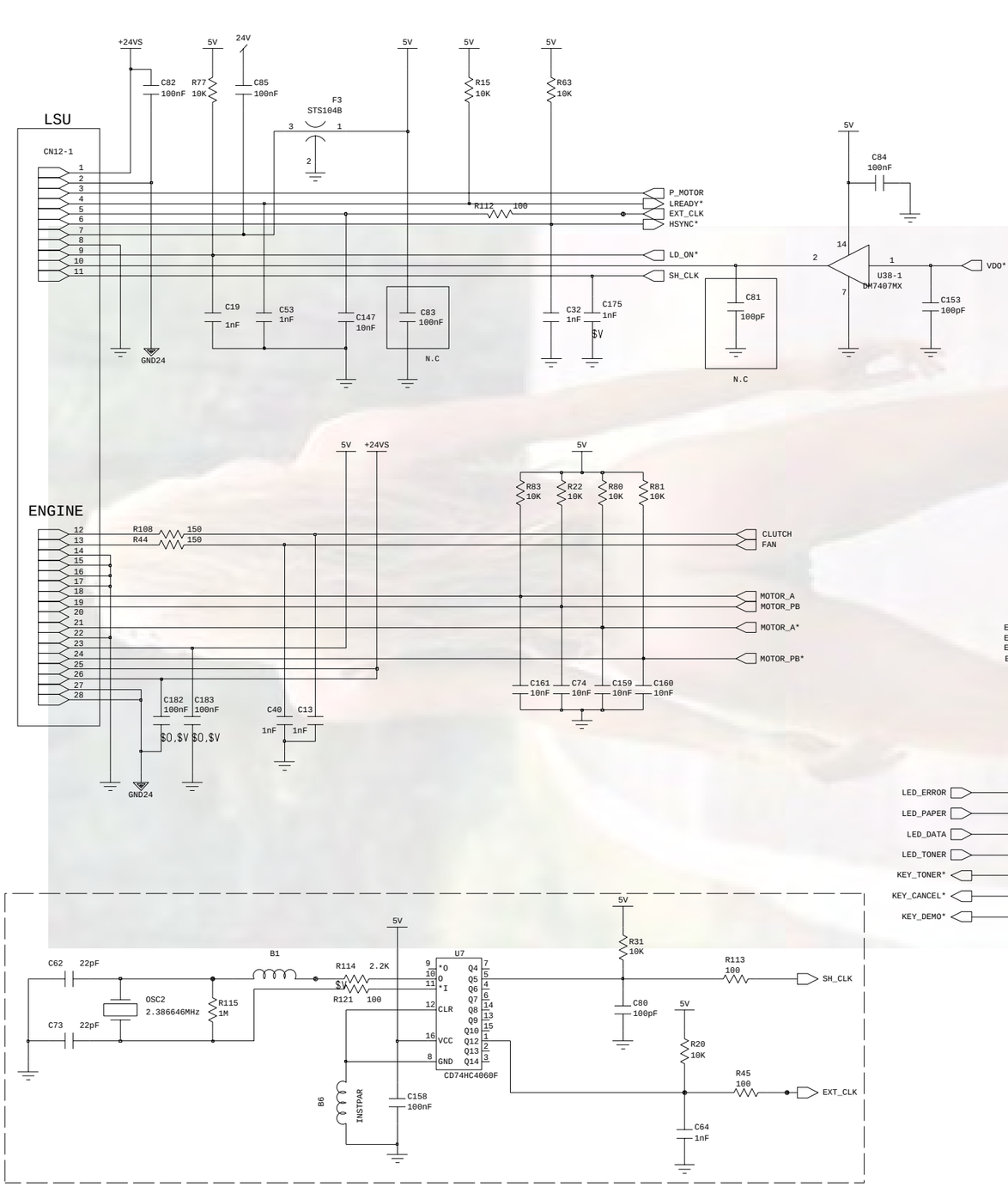




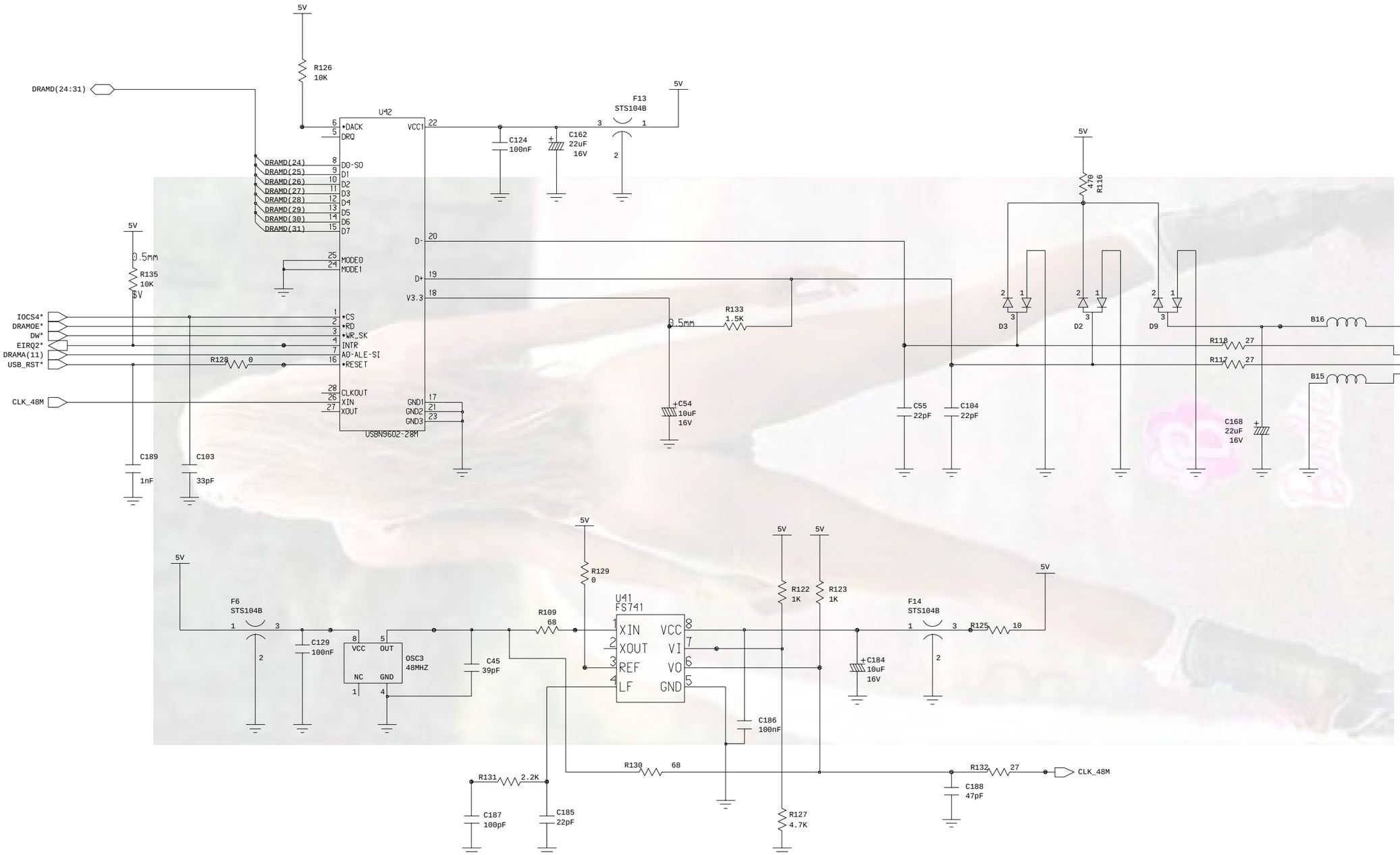
PAPER SENSOR



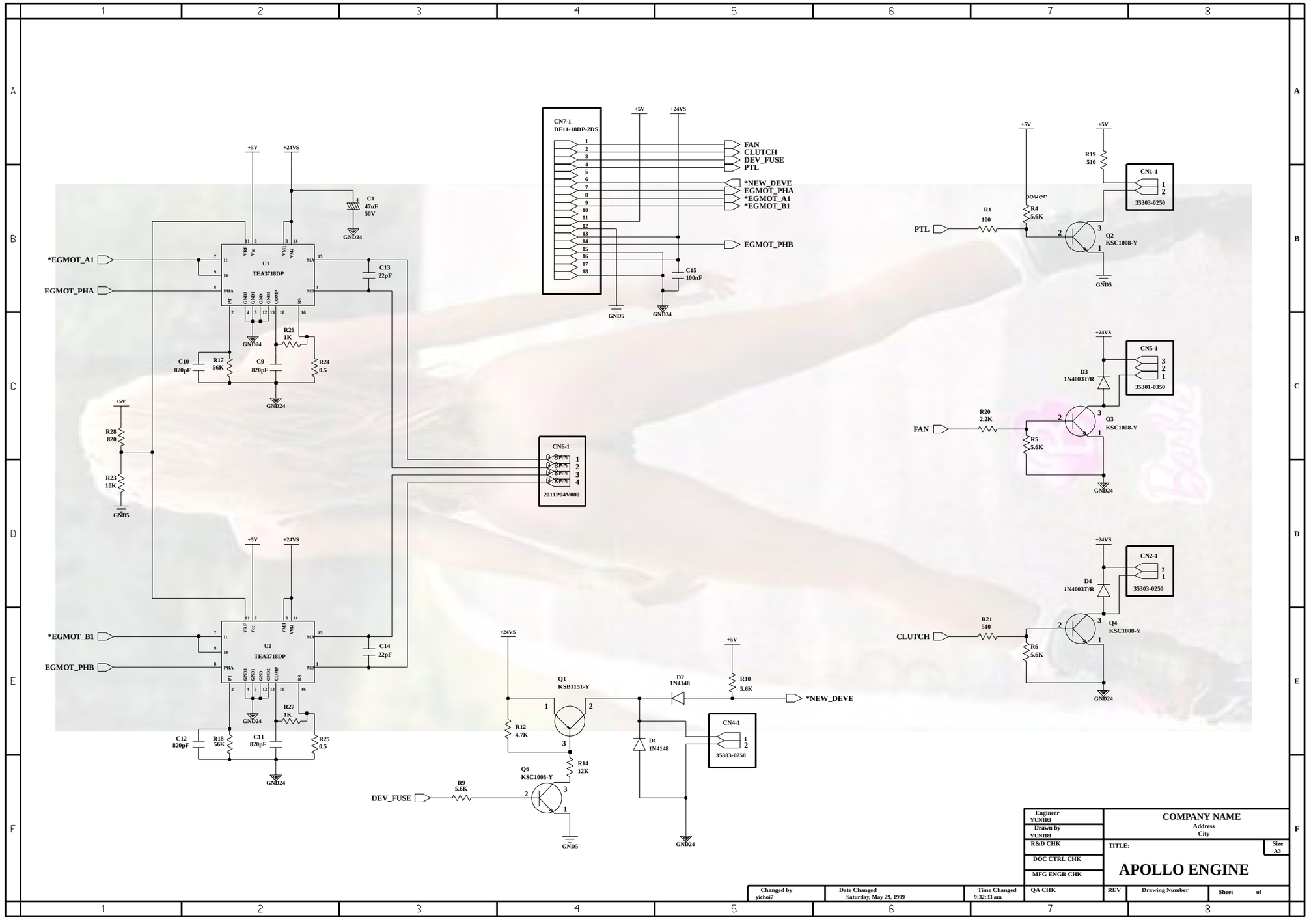
Main Circuit Diagram(8/9)



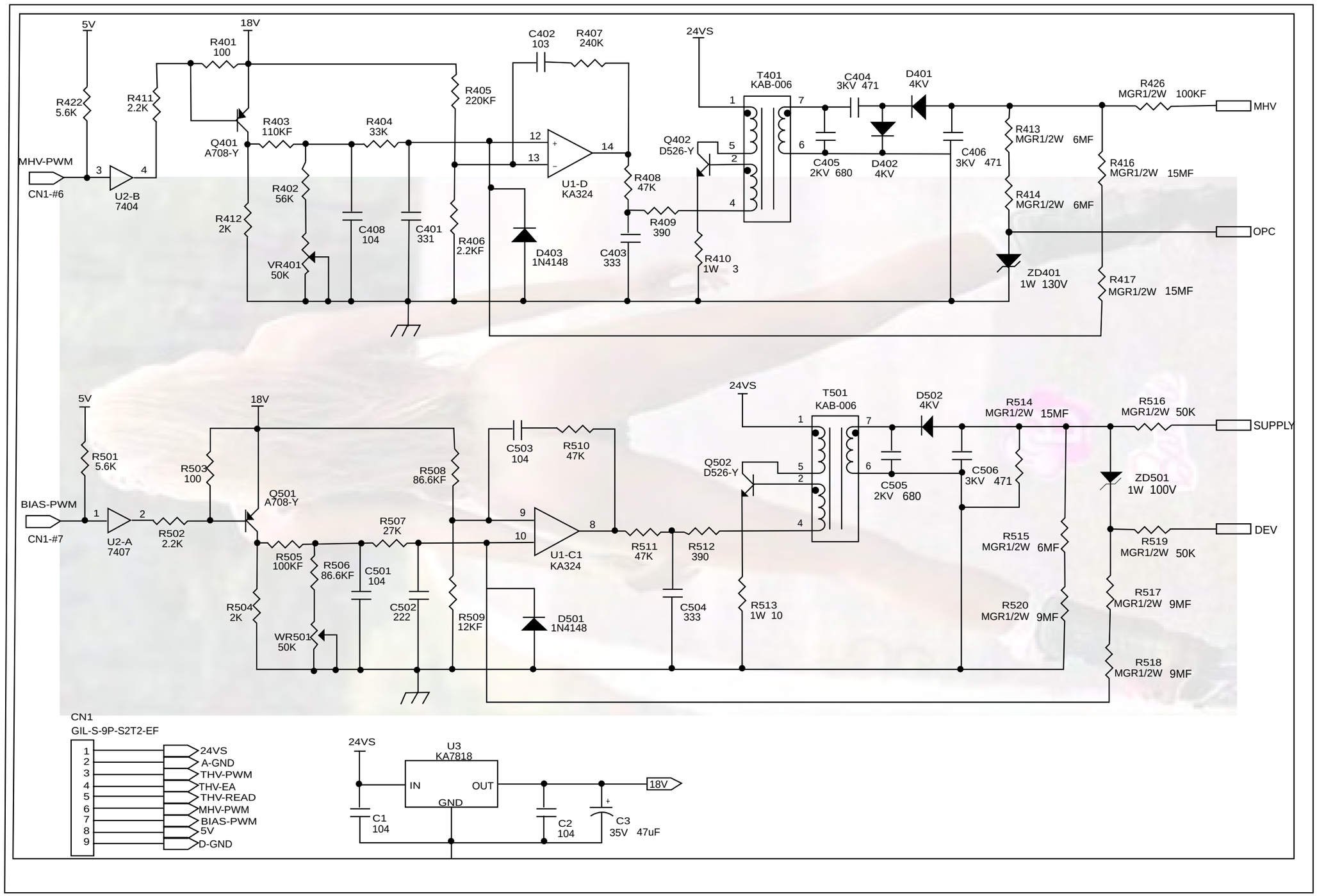
Main Circuit Diagram(9/9)



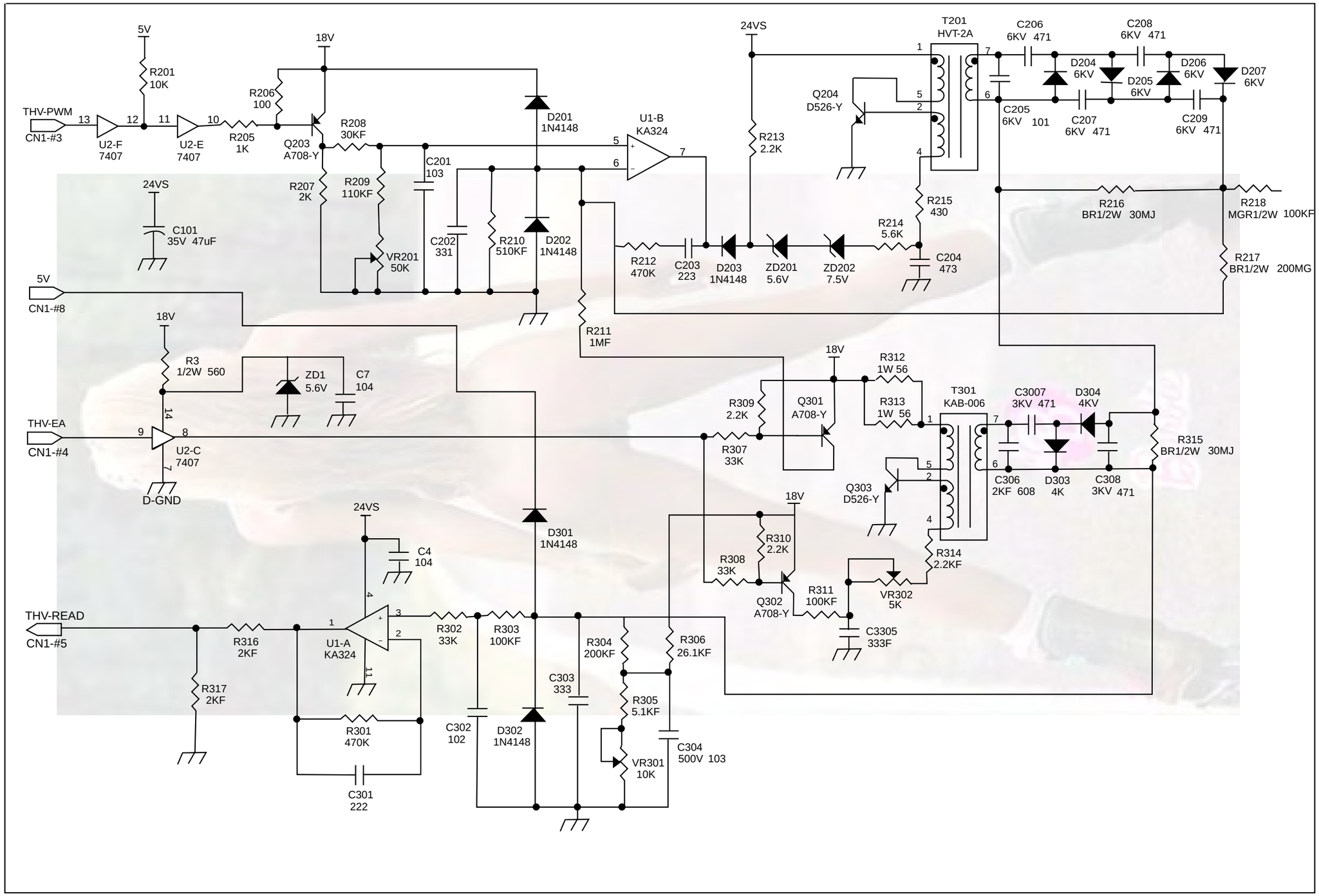
10-2 Engine Circuit Diagram



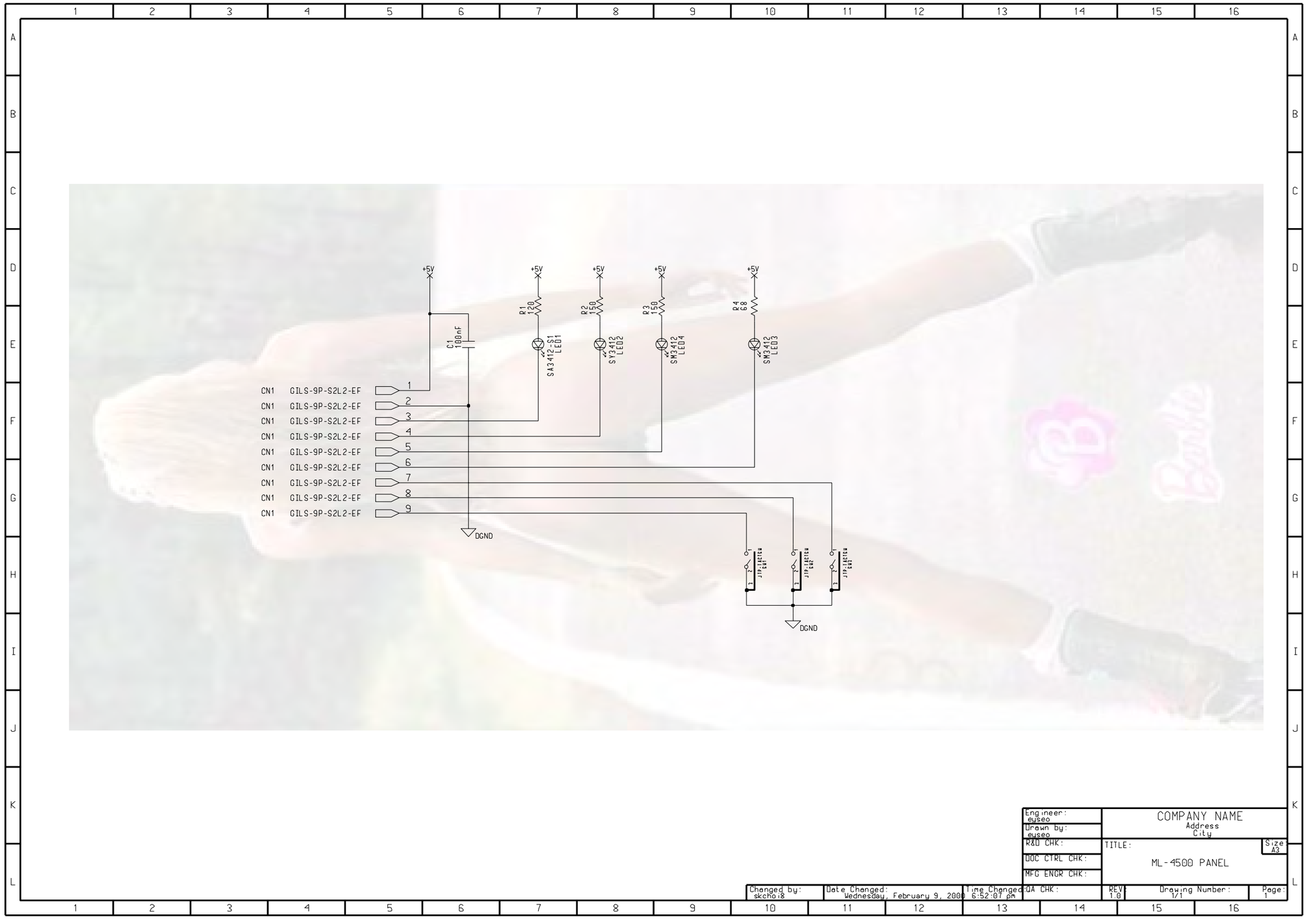
10-3 HVPS Circuit Diagram(1/2)



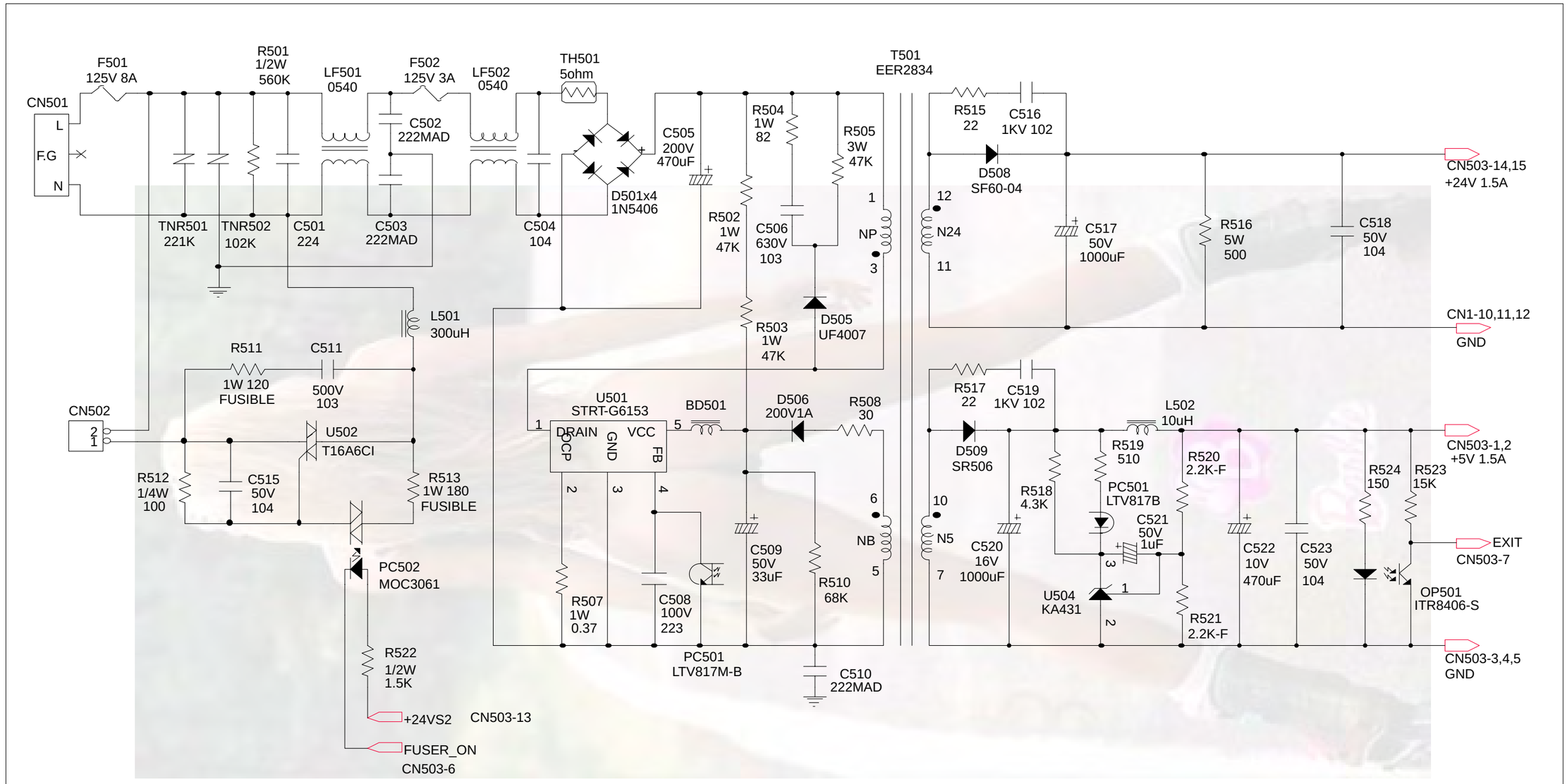
HVPS Circuit Diagram(2/2)



10-4 Panel Circuit Diagram



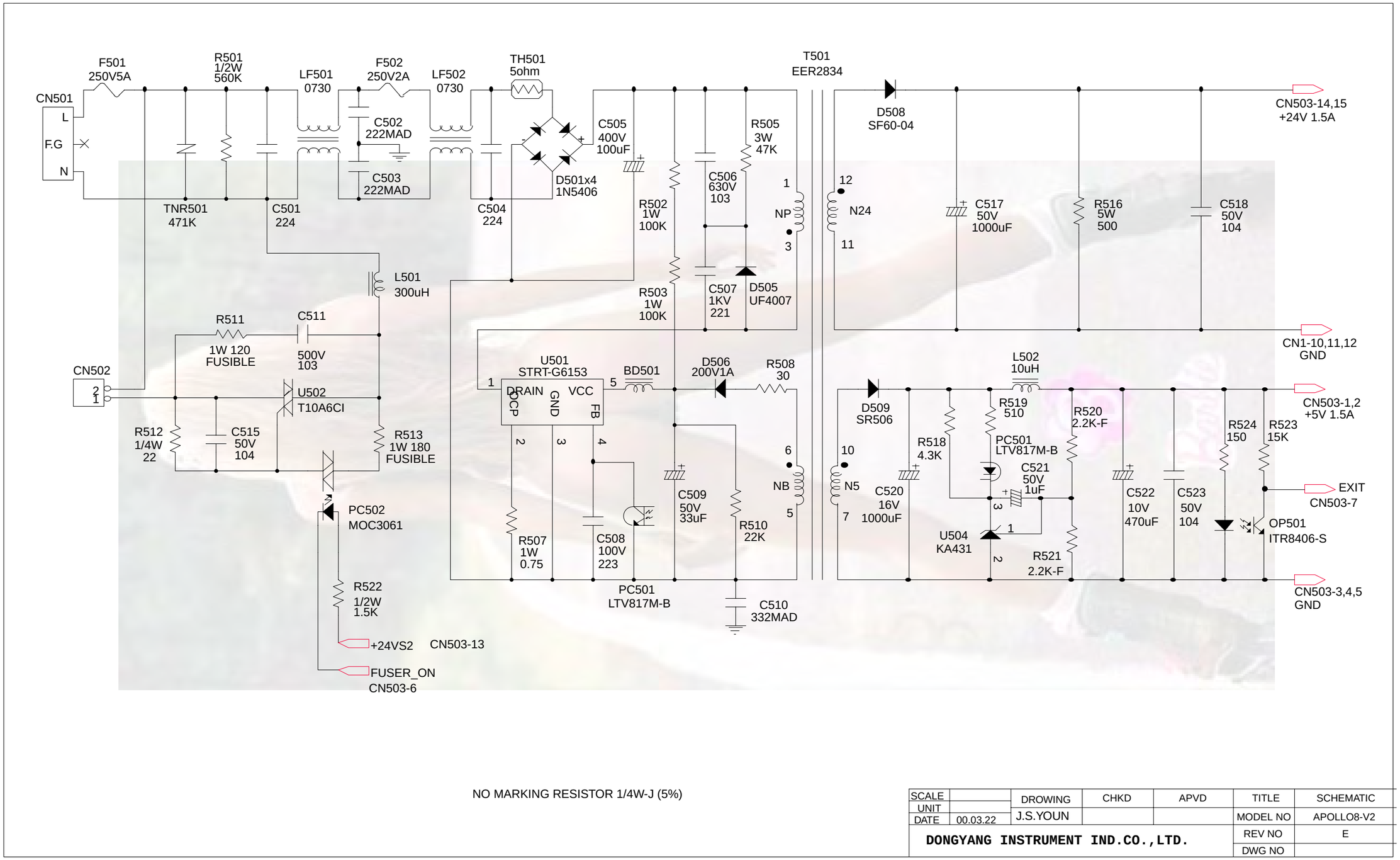
10-5 SMPS Circuit Diagram(110V)



NO MARKING RESISTOR 1/4W-J (5%)

SCALE		DROWING	CHKD	APVD	TITLE	SCHEMATIC
UNIT		J.S.YOUN			MODEL NO	APOLLO8-V1
DATE	00.03.22				REV NO	E
DONGYANG INSTRUMENT IND.CO.,LTD.					DWG NO	

10-6 SMPS Circuit Diagram(220V)



NO MARKING RESISTOR 1/4W-J (5%)

SCALE		DROWING	CHKD	APVD	TITLE	SCHEMATIC
UNIT		J.S.YOUN			MODEL NO	APOLLO8-V2
DATE	00.03.22				REV NO	E
DONGYANG INSTRUMENT IND.CO.,LTD.					DWG NO	

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